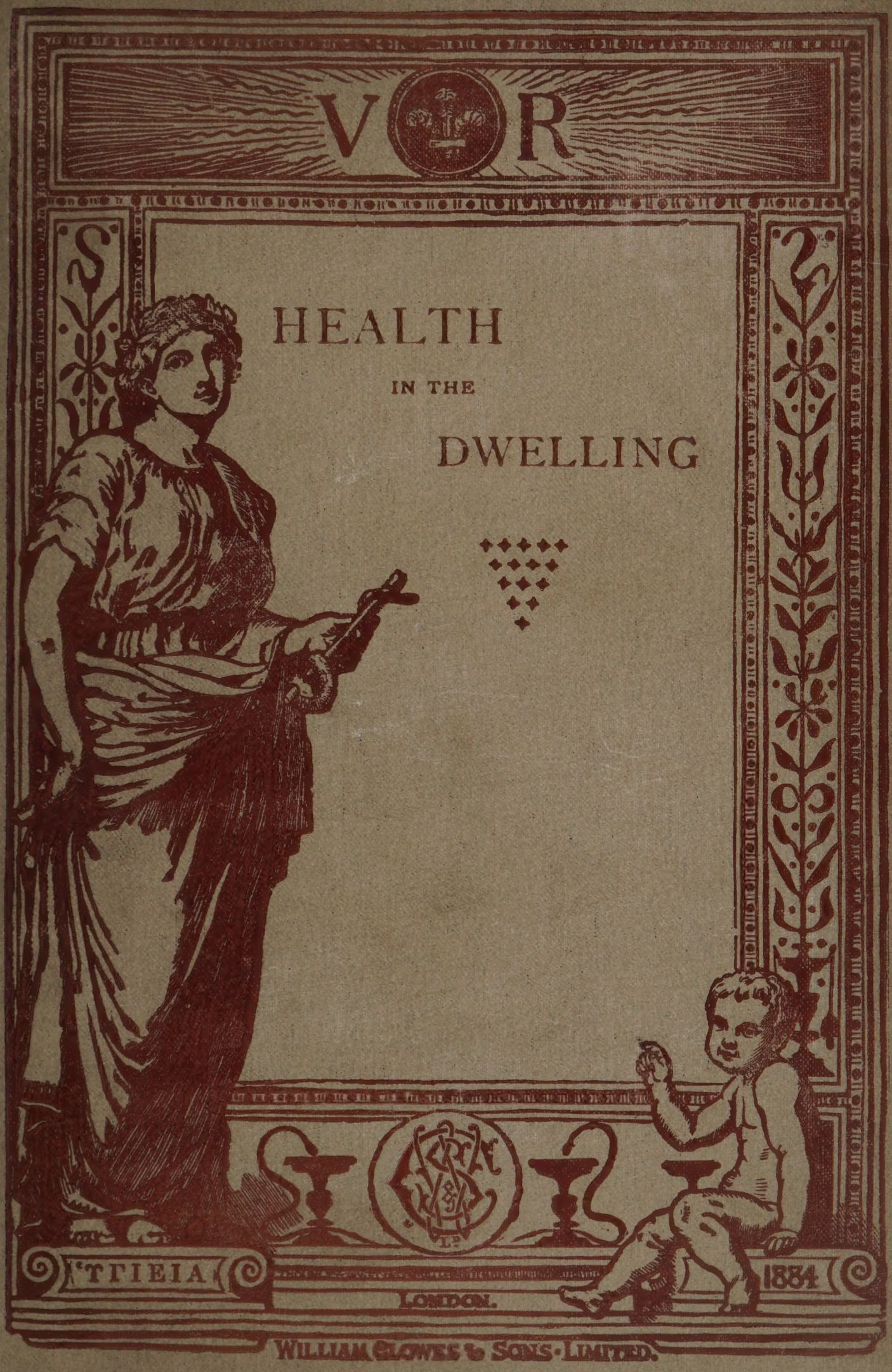
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FOR THE PROMOTION

OF HEALTH

Founded 1876

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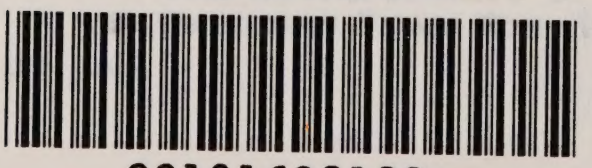
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THE SANITARY CONSTRUCTION OF HOUSES.

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SUGGESTIONS TO THE ROYAL COMMISSIONERS ON THE DWELLINGS OF THE POOR.

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AN ACCOUNT OF THE WORK OF THE MANSION HOUSE COUNCIL ON THE DWELLINGS OF THE POOR.

"The Bitter Cry of Outcast London."

THE Mansion House Council on the Dwellings of the Poor was appointed at a public conference held at the Mansion House on the 11th December, 1883.

The main object of the Council is to enforce the laws at present existing, so far as they relate to the sanitary condition of dwellings, and more especially the Acts identified with the names of Sir Richard Cross and Mr. Torrens. Whilst devoting their best energies to this purpose, the Council feel that any efforts made for the amelioration of the condition of the poor should be primarily directed to awakening a sense of self-respect, self-restraint, and a love of decency and order in the people themselves.

To this end they have thought it advisable in the first instance to address themselves to the formation of Local Sanitary Aid Committees, consisting of ladies and gentlemen able and willing to give time to personal work amongst the poor in their neighbourhood. The whole of the Metropolitan area has been divided into convenient workable districts, and thirty-one committees of from twelve to twenty members each have been set to work to find out and report by means of communication with persons already

visiting the poor for charitable or religious purposes, the exact condition, not only of the dwellings, but particulars also of the occupation and income of the inhabitants themselves where obtainable.

These Committees work by defined rules and according to an approved plan. They are visited by the executive officer of the Council, Dr. Whitelegge, who is himself an expert in sanitation, and a monthly report is presented to the Council on forms supplied by it, showing the number of cases in hand, their method of treatment, and the results attained.

Papers setting forth sanitary defects are freely circulated from house to house, and complaints invited; such complaints, after verification by members of the Local Committee, are forwarded to the sanitary authorities. If by this means the matter is set right, the case is dismissed; but should opposition from any cause be encountered, and stronger measures rendered necessary for the enforcement of the law, the case is reported by the Local Secretary to the Council, who reserve in their own hands all powers of litigation.

Experience has shown the necessity for caution in the choice of members of Local Committees, and that it is important that the members of Committees who undertake to visit with a view to the verification of sanitary defects should, where possible, be persons of experience already engaged in local work, as it is undesirable that the poor should be harassed by many different visitors.

It is distinctly understood that *no distribution of charity* is to be made in the name of the Local Committees, as that is not the work of the Mansion House Council.

The general duties of Local Committees are—

To receive complaints regarding sanitary defects and to deal with them. The following are some of the points to which attention is paid :—

> Overcrowding; ventilation; the supply of water, and the state of cisterns; the character of the privy accommodation; the drainage; the state of dust-bins

and the removal of dust; accumulation of manure, filth, or trade refuse; the state of chimneys; white-washing and papering; damp; holes in roofs or floors; the removal of infectious cases; disinfection after infectious illness; the sites, foundations, and character of new buildings.

To inform householders, tenants, and others, of the powers which they possess, and the duties incumbent on them under the existing sanitary laws.

To show how infectious disease and its extension may be prevented, the advantages of isolation and disinfection, and the means by which these may be obtained.

To notify to the Central Sanitary Aid Committee all inquests, in which it appears that the condition of the dwelling has been in question, as possibly related to the cause of death.

To co-operate with such members of Vestries and District Boards and their officers as take an interest in sanitary work, with a view to helping and facilitating their action in working the provisions of the Sanitary Laws.

To communicate with School Board Visitors, and other workers in the district, so that the Local Sanitary Aid Committees may form centres of reference for the notification of sanitary defects, and of the existence of cases of dangerous infectious disease.

To watch all building operations in their district, with a view to insuring that those provisions of the Building Acts are carried into effect which relate to the proper construction of houses and the preservation for each house of the amount of open space which the Act requires.

To watch for and promote opportunities for converting disused burial-grounds and other areas into open spaces for the use and recreation of the people.

The expenses of the Local Committees are for the most part borne by the Mansion House Council, who supply all necessary material in shape of circulars, forms, books and maps free of cost.

The Central Sanitary Aid Committee meets at the

Mansion House every fortnight, or oftener as required, to receive the report of their Executive Officer, and to affiliate new Committees as they are formed. At the present time, thirty-one Local Committees are at work, viz.:—West Marylebone, East Marylebone, Central Paddington, South Paddington, Lambeth, Hampstead, Whitechapel, St. George's-in-the-East, Bishopsgate, Holloway, North Marylebone, Clapton, Holborn, Limehouse, Greenwich, South St. Pancras, St. James' Westminster, and St. Ann's Soho, Camberwell, Stoke Newington, Fulham, North Kensington, Brixton, St. Luke's and Clerkenwell, Bloomsbury and St. Giles', Deptford, Hammersmith, Kensington, Mile End Old Town, Pimlico, Shoreditch, St. Pancras (North).

In addition to these, the following are expected to commence operations very shortly, preliminary steps having been already taken for their formation, viz.:—Battersea, Bermondsey, Barnsbury, Bethnal Green, Islington and Poplar.

The Council are in possession of lists of almost every class of workers amongst the poor, including City missionaries, School Board inspectors, district visitors, Bible-women, Scripture readers, inspectors of lodging-houses, visitors from the Strangers' Friend Society, the Charity Organisation Society, the Jewish Charitable Aid Association, and the Order of St. Vincent de Paul.

The Council have met with the warmest support from the clergy and ministers of all denominations; and through them and existing organisations rooms for the meetings of Local Committees have in many instances been obtained free of charge.

The readiness with which voluntary effort has been placed at the disposal of the Council, has been most encouraging; but they are still in want of workers, especially of such as can and will work in the East End and in the Southern districts. The results of very many investigations which have been undertaken by private enterprise have been freely placed at the disposal of the Council, whose work has thus been considerably lightened.

The amount of detail involved in the work is enormous, and would be utterly beyond the power of the Council to accomplish, were it not for such assistance, and for the self-denying labours of the very large band of voluntary workers who have already come forward to aid in the work.

The practical nature of the work the Local Committees are doing may be seen from the accompanying table showing the number of cases dealt with during the months of February, March, and April of this year.

1884.	New Cases.	Old Cases.	Dismissed		Deferred for further Observation and Inquiry.	Reported to					
			As Unsuitable.	Satisfactorily Completed.		Owner.	Sanitary Authority.	Water Company.	Police.	Central Committee.	Otherwise dealt with.
February.											
8 Local Committees.	97	55	10	30	47	6	95	—	—	1	11
March.											
15 Local Committees.	240	120	24	69	105	8	232	7	—	7	3
April.											
22 Local Committees.	290	338	21	83	288	5	220	33	—	3	2

It will readily be understood that the formation and setting to work of the numerous Local Committees specified herein has been no light task, particularly when it is remembered that with the exception of the executive officer, the assistant secretary, and a clerk, the whole work has been accomplished by the voluntary labours of members of the Council.

These labours have, however, been already abundantly rewarded, by the fact that several hundreds of ladies and gentlemen have been brought into personal contact with the poor in their daily life, which is of itself, in the opinion of the Council, one of the most powerful of remedial measures that can be used for the promotion of the object they have in view.

The Council believe that they are in a fair way to be able seriously to grapple with this great social problem, but they are more than ever convinced that this will necessarily be a work involving much time, great patience and perseverance, and not a little expense.

The larger questions of rebuilding and rehousing the poor have not been lost sight of by the Council, who have had before them as one of the most pressing of their duties the due consideration of many schemes more or less carefully thought out, amongst which may be mentioned one for the formation of a Public Trust, which if put into execution would provide for the housing of large numbers of working people around suburban railway stations, and also by means of low-rented tenements in blocks, at the various centres of labour.

The Council is gradually becoming a means of intercommunication between persons desirous of purchasing bad property, with a view to converting it into habitable dwellings, and owners willing to dispose of the same. By receiving and diffusing information on these points the Council hope to be the means of gradually replacing some of the most objectionable of the "slums" by buildings of a healthy character, at rentals within the power of the very poorest to attain.

Many Vestries and other local authorities have, through the action of the Council and its Local Committees, been aroused to a sense of their responsibilities, but the Council regret to say that the majority still neglect or decline to put in operation the regulations which the Local Government Board recently pointed out to them they have it in their power to enforce.

The two most urgent wants of the Council at the present moment are :—

First. The prompt and efficient supply of Funds to enable them to prosecute the work they have undertaken, so long as any remains to be done.

By exercising the greatest economy, the working expenses of the Council average £25 per week. *Any one, therefore, who will give or can collect this sum may be the means of extending by one week the operations of the Council, and, by so much reduce the misery of the Outcast Poor of London.*

Second. Offers of help from those who can personally give time to the work, in their own or other localities, in order that the operations of the Sanitary Aid Committees may be pushed forward with vigour and success.

Remittances may be made to the Rt. Hon. the Lord Mayor, M.P., at the Mansion House; or to John Hamer, Esq., Hon. Sec., at the Offices, 3 Queen Victoria Street, E.C.

CONFERENCES ON

THE DWELLINGS OF THE POOR,

HELD BY THE

MANSION HOUSE COUNCIL,

JUNE 4, 5, AND 6, 1884

CONFERENCE ON WEDNESDAY, JUNE 4, 1884.

The Right Hon. The LORD MAYOR, M.P., in the Chair.

1. "*The Population of London and its Migrations.*" By Dr. G. B. LONGSTAFF.
2. "*The Treatment of the London Poor.*" By Miss GERTRUDE TOYNBEE.
3. "*Overcrowding.*" By Rev. A. MEARNS.

THE CHAIRMAN said the subjects for discussion that day —"The Population of London and its Migrations," "The Treatment of the London Poor," and "Overcrowding"— were of the greatest importance, and no doubt Dr. Longstaff would put before them some very interesting information as regards the alterations in the residences of the densest portions of the London population. The treatment of the London poor was a subject the importance of which could not be exaggerated, and overcrowding was, of course, a most important question, because overcrowding was the great foe to health and comfort, and he might say, to the

morality of any city where it prevailed. He would not detain the meeting by any remarks of his own, as no doubt every one was very anxious to hear the views of those gentlemen who had paid great attention to the subject. He might merely express his sense of the great importance of the different subjects which brought them together that day, and he thought he should be expressing their feelings if he thanked the authorities of the Exhibition for having given them the opportunity of meeting to discuss so very important a subject. He would now call upon Dr. Longstaff to read his paper.

THE POPULATION OF LONDON AND ITS MIGRATIONS.

THIS Conference has been summoned to discuss the Housing of the Poor, but since the houses exist for the people, not the people for the houses, and the exceeding numbers of the one cause the special difficulty as to the other, I have presumed to ask your considerate attention to some dry figures.

As far back as history extends, we find men living in large cities, some very ancient ones, such as Nineveh and Babylon, large even compared with most of the capitals of modern Europe; but it may be asserted with little fear of contradiction, that such an agglomeration of human beings as is now living, toiling, suffering, pleasuring, entering the world and quitting it, to north and south, west, and more especially east of us, making up modern London, is absolutely without precedent in ancient or modern civilisation. Numbers fail utterly to give us an idea of its vast size which can only be grasped by comparison with other populations. The table shows the populations of the four largest cities of the Western World, the twelve least populous countries of Europe, that have the fewest people, also of British North America, and our colonies in Australasia.

POPULATION IN MILLIONS, 1881.

Belgium	5·5	Australasia	2·9
Roumania	5·3	Switzerland	2·9
Ireland	5·2	**Paris**	**2·2**
Sweden	4·6	Denmark	2·0
Canada, &c.	4·5	Norway	1·9
Portugal	4·4	Servia	1·9
Holland	4·1	Greece	1·7
London	**3·8**	**New York**	**1·2**
Scotland	3·7	**Berlin**	**1·1**

From this it is at once apparent that London far exceeds in population not only Paris, the city that comes nearest to it, but Scotland, Switzerland, and even our colonies at the Antipodes. It has double the population of Norway, of Servia, of Greece, nearly double that of Denmark. Its inhabitants are three times as numerous as those of New York or Berlin. London contains more people than Paris, Berlin, and Brussels taken together, while it more than doubles the united inhabitants of New York and the neighbouring cities of Brooklyn, Hoboken, and Jersey City. So far by London I have meant the metropolitan area, as it is called, the London of the Metropolitan Board of Works and of the Registrar General, and unless the contrary is specified this will be the meaning attached to the word London throughout this paper. But outside this area there is fast closing in a circle of towns such as Bromley, Croydon, Kingston, Brentford, Tottenham, Stratford, and West Ham, all of which are included within the Metropolitan Police District, and go to make up what the Registrar General calls Greater London. This London has a population but little short of five millions, and therefore exceeding that of Sweden and approaching that of Ireland.

London has certainly been a large and important city since the time of the Roman occupation, but we have no means of estimating even approximately the number of its inhabitants before the beginning of the present century. It is stated that, A.D. 359, some 800 vessels were employed

in the port of London in the export of corn. Truly, matters have changed since then! Whatever was the size of London in her time, it is quite certain that good Queen Bess thought it was quite large enough, since she issued a proclamation from Nonesuch Palace, on the 7th of July, 1580, forbidding the erection of buildings where none had before existed in the memory of man, as she deemed the extension of the Metropolis likely to increase the plague; to create a trouble in governing such multitudes; a dearth of victuals; the multiplying of beggars, and inability to relieve them; an increase of artizans, more than could live together; and, moreover, as likely to impoverish other cities for lack of inhabitants. The decree stated that lack of air, lack of room to walk and shoot, &c., arose out of a too crowded city. In 1631 Sir R. Ducie, the Lord Mayor, reported to the Privy Council by special command, in view of an impending scarcity, that "the numbers of mouths esteemed to be in the city of London and in the liberty," comprising London within the walls, London without the walls, and the Borough of Southwark, to be 130,268. But as the great plague, only thirty-four years later, is said to have killed very nearly 70,000 persons, there must have been a considerable population outside the range of Sir Robert Ducie's estimate. With the beginning of the present century we get on firmer ground. According to the Census of 1801, the people of London mustered 958,863; by 1841 this figure was more than doubled, viz., 1,948 417, a million of inhabitants having been added in forty years; in the next twenty years another million were added, and again in the next twenty yet another million; in other words, in forty years the additions to London equalled the collective present populations of Liverpool, Birmingham, Manchester, Leeds, and Sheffield, or the entire population of Norway, bringing up the numbers in 1881 to 3,816,483. But in spite of Queen Elizabeth's proclamation, London is not yet grown up; it is still growing at the rate of 56,000 a year, 1000 a week, 150 a day! At this moment

by the trifling addition of a Wolverhampton or a Hull, London probably numbers at least 170,000 more inhabitants than at the last census.

This growth is far from uniform. In the map the black ring and all within it represent the Metropolitan area; the part outside round about bounded by the red line is what the Registrar-General calls the Outer Ring, and extends from the outskirts of Local Government London, to the boundaries of Metropolitan Police London. In the centre is a portion left uncoloured, called in the census the Central Area, and comprising the City, Strand, Westminster, &c., the part coloured black, may be called the Inner Ring. The census shows that during the last ten years the population of the Inner Ring has increased by 536,547 persons, or a Liverpool and a Birkenhead. The Outer Ring, during the same time, increased by 318,797 persons, say a Leeds; but it was otherwise with the central area, where there was a decrease of 74,324, equal to the population of Halifax.

This needs some comment. As it is of great importance that a census should be taken simultaneously all over the country, it is convenient that a time should be chosen when but few persons are moving about, such a time is a Sunday night. But obviously on a Sunday night the numbers in the business parts of a town will be at the lowest, whereas the residential suburbs will then have most inmates. The City authorities, for reasons which may be divined, were greatly incensed at the results of this method of numbering the people, and took a day census on their own account; through the very valuable and interesting report on the results of this there runs a spirit of indignation which is quite amusing. I am by no means convinced that the proposed new municipality would be the great success that its promoters love to fancy, since new machinery does not necessarily provide new men; but the Report of the Day Census of the City, when arguing against the proposed enlargement of the Corporation, seems to me to prove too much. If it be true that, whereas according to the Imperial

Census, only 74,897 persons slept within the City, whereas the Corporation enumerators found 261,061 persons to be "residing, occupied, or employed" therein "during the working hours of the day," and in addition counted 797,563 passengers into the City by the various inlets during a single day; and if, moreover, the first number is decreasing, whereas the other two numbers are increasing, surely the conclusion is that a city, which is yearly less and less capable of providing sleeping accommodation for its workers, should enlarge its bounds. The causes of the diminished number of sleepers in Central London are chiefly clearances for railways, public buildings, and new streets, and the conversion of dwelling-houses into places of business.

The growth of a population is made up of two factors: (1) the Natural Increase of the people, and (2) Migration. The Natural Increase of a population is measured by the excess of births over deaths, which would be the only cause of change if there were neither emigration nor immigration. As a matter of fact all populations are affected by both of these movements; that of London more especially. The admirable Weekly Return of Births and Deaths in London, now issued by the Registrar-General's Department, is the lineal descendant of the old bills of mortality issued by the parish clerks with more or less regularity since 1603, a pedigree which should place the Weekly Return very high indeed in the aristocracy of periodical literature. From this high-born, but unassuming paper, we learn that in each year some 125,000 persons are born in London, and some 80,000 die, giving 342 daily births, and 219 daily deaths, a Natural Increase of 123 per diem.

The population of London as a whole increases considerably faster than the excess of births over deaths would account for, that is to say, there is extensive *immigration*. On the other hand, the number of Londoners who are also London born, does not grow nearly so fast as would result from natural increase left to itself; therefore there must be considerable *emigration* from London (using emigration in

a general sense, and not necessarily implying thereby a long sea voyage). This is also shown by the fact that the Londoners living in the provinces in 1881 exceeded those enumerated in 1871 by 148,336.

There is no record of the numbers who annually come from Ireland and Scotland, from various parts of England and its colonies, from Europe or America to settle in London, nor of those who leave its smoky streets for clearer skies. In the absence of the requisite *data* we must be content with the balance struck by the Census every ten years, which expresses the net result of all the changes:—

Ten years, 1871–1880.	Excess of Births over Deaths.	Enumerated Increase.	Balance of Migration.
Central Area . . .	78,464	- 74,324	- 152,788
Inner Ring . . .	376,011	+636,547	+260,536
Metropolitan Area . .	**454,475**	**+ 562,223**	**+ 107,748**
Outer Ring . . .	119,910	+318,797	+198,887
Greater London. . .	**574,385**	**+ 881,020**	**+ 306,635**

The table shows that as the final result of ten years of destruction, reproduction, and locomotion, the inhabitants of the central area decreased by 74,324; but since the excess of births over deaths during the same period was 78,464, it is plain that *at least* 152,788 persons must have changed their abodes to some place without the central area. But it is certain that an unknown number went into this area; these may be said to have "paired" with an equal number who "went into the other lobby"—emigrated. In like manner we see that *at least* 260,536 immigrants settled in the "Inner Ring," and at least 198,887 in the "Outer Ring."

We learn something as to whence the immigrants come by studying the tables of birthplaces in the census.

LONDON—BIRTHPLACES OF THE PEOPLE.

	Numbers.	Per 1000 Inhabitants.
Natives of London	2,401,955	629
„ other parts of England and Wales . .	1,179,220	314
„ Ireland	80,778	21
„ Foreign Parts . .	78,456	16
„ Scotland	49,554	13
„ the Colonies. . .	26,520	7
Total. . .	3,816,483	1000

As compared with 1871, the Irish in London formed a somewhat less fraction of the whole at the last census, while provincials and foreigners were somewhat better represented. Doubtless many will be surprised to see that Scotch, Irish, foreigners, and Colonists, all put together, number only some 6 per cent. of the London people; but it should be kept in mind that children born in London of Irish or German parents will be classed among the London born.

The most numerous among the foreigners were Germans, 21,966; French, 8251; Poles, 6931 (mostly Jews, and very poor); Dutch, 4193; and Italians, 3504.

A few facts as to the occupations of Londoners will be of interest. To begin with, there is no great manufacture in London, save those of furniture and books, consequently there is not found any preponderance of operatives in any one trade. London is the seat of government of a vast empire, hence we find the Civil Service employs of all ranks 16,670 individuals, including 762 women. The paid officers of the Local Government and of the Poor Law numbered at the last census, 2774; 624 of them women—a surprisingly small body, soon, perhaps, to be greatly increased, for the benefit of the ratepayers. The police

numbered 9354, the soldiers about the same; so that less than 20,000 men sufficed to keep in order $3\frac{3}{4}$ millions of people—roughly, one policeman and one soldier to every 420 inhabitants. The clergy of the Established Church numbered 1961, the ministers of other denominations 1134; as assistants to these may be added 1302 missionaries, bible-women, &c., and 1131 nuns and sisters of mercy. *Per contra*, the lawyers, besides an army of clerks, numbered 5905—as yet all men. The doctors were 3705 strong, including 10 women. Schoolmasters and mistresses were as many as 17,963, a number $2\frac{1}{2}$ times as great as that recorded in 1871, the increase being, of course, due to the operation of the Education Act.

The most numerous class in London seems to be domestic servants, of whom 301,188 were enumerated, five-sixths of them women. Next come the building trades, employing 121,182—caring little, I fear, for Queen Elizabeth's proclamation; the furnishing and decorating trades employ 42,366. The London printers are no fewer than 26,226; the railway servants being hardly less numerous—21,951. The publicans, amount to 7731; their natural associates, the pawnbrokers, to 2378. On the other hand, coffee and eating-house keepers number only 3686. Among the poorer classes may be mentioned 77,796 general labourers, 8564 costermongers or hawkers, 48,559 washerwomen, and 19,334 charwomen. The magnitude of the Metropolitan charities may be judged of by the fact that 4186 persons, four-fifths of them women, are returned as in "hospital and institution service."

The trades most commonly followed by foreigners in England, and therefore presumably in London, are those of sailor, servant, tailor, teacher, clerk, merchant, musician, and baker.

There is no direct means of ascertaining how many out of the four millions of Londoners can be rightly called *poor*, meaning by poor those who are constantly or at frequently recurring intervals in absolute want of food and clothing.

Nevertheless, some indications of the extent to which distress exists may be gleaned from the census. Thus, the blind numbered 3214, the deaf and dumb 1972, lunatics and imbeciles, 6032 (more than half being inmates of asylums). Of these 10,218 persons belonging to what are known as the "afflicted," many would of course be in good circumstances, but all who have worked among the poor must have observed in how many cases an "afflicted" child, much more an afflicted parent, drags down a whole family to the verge of poverty. The struggle for existence is severe for the healthy, a little extra trouble makes it unsupportable. Then again, there were no less than 173,143 widows. But there is some more direct evidence. The workhouses and workhouse schools contained 35,511 paupers, while at the same time 43,723 persons were in receipt of out-door relief. In the hospitals 7375 sick were under treatment. Juvenile offenders gave 1790 pupils to reformatory and industrial schools, whereas the prisons contained 6924 full-blown criminals. These numbers will justify us in saying that the very poor cannot number less than 100,000, there must, however, be a much larger number but a very little removed from this class. As regards housing, the figures show that of these 100,000 very poor, some 50,000 are the inmates of public institutions. The Dwellings Company of the Charity Organisation Society ascertained in 1881 that there were at that time in London nearly 40,000 persons accommodated in various improved dwellings of one kind or another. Also nearly 2000 persons received the benefit of supervision on Miss Octavia Hill's admirable system. Of the 40,000 in Industrial Dwellings many, indeed the large majority, would be above the very poorest class, and, as I think, quite rightly so. The fact that by the City Census it was found that no less than 176,009 passengers entered the City in the single day by the twelve railway stations, gives some idea of the extent to which the outskirts of London supply sleeping accommodation for those who have to

earn their bread near its centre. The "inhabited houses" in London numbered in 1881 no less than 486,186, and are increasing at the rate of 7000 a year.

One word as to the Health of this mass of humanity. The metropolitan area extends over some 12 miles from north to south, some 17 miles from east to west; within this space 39 governments, supposed by common consent to be utterly incompetent, so rule the houses, roads, and drains, of their $3\frac{3}{4}$ millions of inhabitants, that for the last ten years they have only suffered a death-rate of $22\frac{1}{2}$ per thousand,* or but 1 per thousand in excess of that of the whole country. Only 7 of the great towns of England can show a better account, whereas, on the continent of Europe, Christiania and Geneva, mere villages by comparison, alone excel London; Philadelphia and a few of the American cities also are our superiors. Have all the governments that are supposed to be capable, accomplished their task as well? Do not suppose that I bring this forward as an argument for the maintenance of the *status in quo*, far from it; I wish to impress on you that by quiet, steady perseverance on similar lines we have a reasonable hope of accomplishing yet more. That we raise a bitter cry does not mean that we are worse than we have been; it rather means that we are realising more fully that we might be better. It is believed that in the 17th century the deaths in London exceeded the births, and that the death-rate then was something like 49 per 1000, per annum, or more than double what it is now, and worse by far than the unhealthiest cities of Europe of to-day.

You will now, I hope, be able to some extent at least, to realize the enormous scale upon which social problems present themselves to the London Philanthropist, the vast mass of raw material that he has to work upon. I must leave to others the more cheerful task of giving practical suggestions, of describing schemes to improve the dwellings

* Ranging from 20·8 per 1000 in the Western districts to 21·8 in the Northern and Southern districts, and 24·9 in the Central and Eastern districts.

of the toiling myriads of our metropolis. On my own part I have but one more word to say, and must confess myself a disciple of Queen Elizabeth, and wish that something could be done, if not to diminish the number of inhabitants, at least to prevent their increase, in which case it might be possible to work off the vast mass of arrears that neglect has allowed to accumulate. As it is, the task seems very hopeless, since there are to-day 150 people more than yesterday, to-morrow yet another 150 will be added, and so on and so on. But one remedy seems at all practicable, that is, emigration; but beware of aiding emigration from London itself to any great extent; if you do so, for every family sent to Canada from Whitechapel or Poplar, two families will rush in from Norfolk or Devon, and even from Ireland. Some 200 persons come in from the country to settle in London every week. Stop these people *en route.* Kidnap them and ship them off to the Antipodes. These countrymen will make far better emigrants than townsmen. In other words, do all that can be done to discourage immigration into large towns, and tell Hodge that if he is dissatisfied with his own parish he will do best to cross the seas.

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DISCUSSION.

The CHAIRMAN said they were much indebted to Dr. Longstaff for the very able and interesting paper to which they had all listened with very great pleasure. Dr. Longstaff had given a very interesting account of the state of things in London, and certainly some of the statistics with which he concluded, as regarded the mortality of the population, as compared with former times, were very encouraging. It reminded him of Macaulay's passage, as to the time of Charles II., when men died faster in the purest country air than they did in the pestilential lanes of our town, and when men died faster in the pestilential lanes than on the coast of Guinea. He hoped that the statistics which they had just heard would show that the progress was maintained. He particularly concurred in the concluding remarks of the paper as to how much better it was for the country labourers to go out to the Colonies than for persons who had been brought up in London. A person going to the Colonies ought to have some knowledge of country pursuits, and the power of working land, and that knowledge was not possessed by Londoners. He thought that a man brought up in Whitechapel would find himself at sea when he was put to tend sheep in Australia.

CANON GREGORY said the question to be brought before the meeting was how to house the people of London ; and those who had been accustomed to live in the poor parts of London for many years knew that a large portion of the people moved, upon an average, every few weeks. In Lambeth the calculation was that everybody in the parish moved once a year ; and if those people had to be housed in the proper way, that fact must be taken into consideration. He had thought that the special point for consideration that day was as to what could be done to assist the poor inhabitants of London, in order to find them

better dwelling-houses; and nothing really could be done effectually unless they grappled with the terrible difficulty that the people were being moved out because they could not pay their rent. Every one in London who was able to pay for a decent dwelling could find a place to dwell in. In the suburbs of London buildings were more numerous than the inhabitants, and at present, in Tottenham, a large portion of the houses were unoccupied. The same remark applied to Edmonton and Enfield; and although the railway fare was only a penny, a large number of the houses were unoccupied. He imagined that a very large proportion of the people who were in the miserable condition which had been described, were in that state from absolute destitution. They wanted money, and the question to be faced was, what were they to do to house the people who were unable to pay rent for the houses in which they dwelt? They could not send them all to workhouses; nor could they be left to die in the street. One suggestion was to find them a place in which they might live under superintendence—a large poorhouse of some kind or other. There were great objections to a scheme of the kind. They must all face the question of what was to be done for the people who really had an infinitesimal amount of food to eat, and were unable to provide a lodging for themselves. This was the great problem of the day, and he had hoped that Dr. Longstaff would have addressed himself to the point. If they were to send the people into the suburbs, who was to pay the rent of the houses?

The CHAIRMAN said he must remind Canon Gregory that his remarks would be more applicable to the subject for discussion the next day, viz., "Suburban Dwellings and Cheap Railway Fares."

CANON GREGORY thought the migration of the people was a special point to be considered; however, he would not detain the meeting with any further remarks.

Mr. THOMAS HARRIOT said, Mr. Longstaff spoke of expatriating Hodge, but he thought there were better ways of dealing with him and preventing him from adding to

the present overcrowded condition of London. The first question he would ask himself was this: why are cities overcrowded? A visit to any country place would at once give the answer, because their was nothing done comparatively for the poor people to attach them to the villages, to educate and fit them for the occupation of those villages, for the various industries which were not even thought of, and which towns demanded in the production of food and the preparation of food for which the people in the city were starving.

Dr. LONGSTAFF proposed a vote of thanks to the Lord Mayor for presiding, which was put and carried unanimously.

The CHAIRMAN announced that as he had to leave he would ask Mr. Samuelson to take his place.

B. SAMUELSON, Esq., M.P., then took the Chair.

The next Paper, by Miss Gertrude Toynbee, on "The Treatment of the London Poor," was read by Mr. H. Toynbee.

THE
TREATMENT OF THE LONDON POOR.

WE who are willing to help the Poor of London, have every variety of work offered us. To give details on this subject would be to write a small dictionary, and I cannot do better than refer all who wish for such details to the new edition of 'The Charities Register and Digest,' with its valuable introduction, by Mr. Loch, the Secretary of the Charity Organisation Society.

I do not purpose to dwell on any special branch of work for the poor, but rather on the *ideal aim* of all such work. In the bewildering multitude of occupations and cares which are so apt to beset us workers, we have need to keep clear before us one high purpose, which shall spiritualise the meanest details of our work, and so prevent us from being "careful and troubled about many things," otherwise "the

fever and the fret" of our activities will injure our powers of service. "The London Poor!" How many of us have been haunted by these words from the time when we were old enough to feel and think, for the great world outside us!

At first, all they suggested was a vague sense of far-off misery. But now and then it seemed to come closer to us. Sometimes the roar of London would reach us as a faint murmur in some quiet spot on its outskirts, and then the thought of its many sorrows would come and sting our peace. Or we entered London in the midst of the summer glory which we had been seeing in the very heart of nature, we came back possessed by "the Spirit of Beauty;" the earth seemed "an unsubstantial faëry place," and sorrow and misery were forgotten.

But as the miles and miles of dreary little houses opened out upon us, we awoke from our dream, and when we drove through the midst of them on our way homewards, and saw the haggard unhappy faces of people, who while we had been away, had never stirred from those hot noisy streets and all the hideous misery there, we felt crushed by "the burden of the mystery and the weight of all this unintelligible world." What had we done to deserve such happiness, and what had they done to deserve such misery? At any rate we could no longer sit still, we must do something to help them. And so a way was found, we took a district, or we visited a workhouse or hospital, or we joined a Committee of the Charity Organisation Society, and then we began to learn what that unknown misery meant. We found it meant for multitudes, lives of ceaseless weary struggle for bare existence, lives so hard and dreary that death was looked upon as a happy release. We found it meant neglect and loneliness for the sick and the aged, a fearful familiarity with vice for the young.

What could we do? The picture was even grimmer than we had anticipated, and the more familiar we grew with its details the more sick at heart and hopeless we became. Before we knew so much, reforms had seemed so

easy. The growing feeling of brotherhood had seemed to augur a mighty change for the better, and in gladness of heart we had sung with the poet,

> "Soon shall thought make labour glad and fair,
> Soon shall labour make thought swift and strong,
> Soon shall music smooth the troubled air,
> Soon religion blossom into song."

And now that all hope seemed to have left us, what was there for us to do? Our small efforts seemed as nothing in the face of the mighty problems which met us. We went on with our work it is true, but in a dull mechanical way. The dry details of Sanitary Aid and Charity Organisation "*cases*" seemed to take up all our time and energy, and we were rapidly becoming mere machines. Insensibly, however, it dawned upon us that, besides all their material privations and sufferings, the poor had a greater privation still. Friendship and social intercourse such as we enjoy, we found almost entirely absent from their lives. Ceaseless toil and worry, and the wretched character of the rooms which formed their homes, made hospitality impossible among them. While the utter want of privacy in their homes made them see each other's characters in the very worst light, every little fault was known and commented on, till mutual trust and respect ceased to exist. Take a house of thirty or forty occupants, in which scarcely a family has more than a single room, and nearly every family consists of father, mother, and several children, sometimes as many as five. Imagine a *home* consisting of the seventh part of a room in a house of forty people! In both rooms overhead, the father of the family is in the habit of coming home drunk. In the room next to you, the mother has a violent temper, and is constantly screaming at the top of her voice and making her children cry. The street-door does not lock, and children from outside rush in and out of the passage all day, while at night, tramps of the vilest description haunt the passage and the staircase, using language which you shudder to think the

children may hear. Added to all this, the neighbouring houses are of the same description, so that the street is full of noise within doors and without. And this is your *home*, a home in which *rest* is impossible, in which *privacy* is impossible. When you are well and bustling about over your work, you don't mind this so much, but if you want to read, or to sit down quietly and think, or if you are lying in bed weak and suffering, the confusion and the noise are terrible; but nothing will stop them, and if you are dying they will go on just the same. This picture is not exaggerated, it is common enough for any one to verify for themselves. Is it not a mockery to talk of the *homes* of the London poor? People who live thus have no *homes*, and yet for the accommodation I have described they pay as much as 5*s.* a week. We may do our best by means of sanitary aid committees to get such houses kept in a decent state; but we can never make them into *homes*. And just because we cannot do this we must do our best to give the London poor *a sense of home*, as it were, in spite of their homes. This aim may give unity and beauty to all our various work for them.

Friendship, pleasant social intercourse, quiet refreshing hours, bright and beautiful surroundings—all the blessings our own homes bring us—we must try and procure for the poor. Viewed in the light of this new purpose, the dry bones of our work will begin to live. The dull "case" work will become humanised when we accept it as loving service for individual men and women. To make it this, we shall take less of it, that we may spend more time over it. Instead of hurrying over our work as Charity Organisation or Sanitary Aid visitors in an official way, we shall pause to make acquaintance with the people we come across, and in so doing we shall learn to realise how the evils we are seeking to remove affect their lives. This lack of anything homelike in their dwellings is the key to so much in the lives of the poor. The physical wear and tear caused by it makes them nervous and irritable; and this accounts for a good deal of their violent language to each other.

The poor children suffer from this ; they are continually shouted at and scolded without rhyme or reason. Sickened by their disagreeable surroundings, men and women try and find a substitute for home in the public-house, that being, as a rule, the only alternative offered them. There drunkenness leads to other low habits, and their characters are ruined for life. It is not that they have *chosen* vice, but that it has been *thrust* upon them by circumstances. If they had been in different surroundings, they would have been virtuous men and women.

We are too apt to imagine that because the poor are *accustomed* to their hardships they do not feel them acutely. But custom can do little for them in conditions such as I have described. Custom too often makes them take them as inevitable, and stifles their complaints ; but it does not make them suffer the less. This is a lesson we learn by intimate acquaintance with the poor. When we know about them only by hearsay, we are apt to take their sufferings very quietly, because we do not realise what they mean. This is why, in spite of all that has been written on the subject year after year, no widespread change has been made in their condition. If, instead of only hearing about them, every one of us had gone among a few of them and learnt to know them and care for them *individually*, there would be among us such a keen sense of their needs, as would make it impossible for us to remain passive, and our hearts being touched, we should intuitively devise plans of helpfulness. "Qui ne pleure pas ne voit pas!" There is an endless amount of philanthropy among us, but it leaves our hearts cold, in fact, by familiarising us with suffering and vice, it deadens our sympathies, and makes us apt to substitute "*cases*" and "*questions*" for men and women. By thus "handling holy things without feeling," we pay the penalty of becoming cynical and misanthropic.

We have talked much of the *dwellings of the poor* lately, and hundreds of us have banded ourselves together in the *Local Sanitary Aid Committees*, formed by the Mansion

House Council. Already we have seen tangible results of our work in the way of sanitary improvements in the dwellings; and we have every reason to hope that the continuous action of these committees will before long create a far higher standard of sanitary requirements for these dwellings than has existed hitherto. But do not let us stop here. Let us try and feel the full pathos of those words we have heard so often, The dwellings of the poor. Let us remember that they mean primarily the privation of some of Life's most essential blessings, of the rest and calm and beauty of home-life, of social intercourse, of opportunity for reading and thought, of privacy in the sacred hours of sorrow and suffering. Let us remember that they mean that childhood is robbed of its innocence and happiness, that old age can find no shelter from the tumult of life. And knowing all this, we shall not rest until we have found ways of, at any rate, in part, restoring these lost blessings. In the first place, we shall not grudge a certain amount of time for friendly intercourse with individual poor. We shall try and understand and believe in them, as *friends* understand and believe in *friends,* that they may have the boon, so rarely gained by their intercourse with each other, of being able to open their hearts freely, and of feeling at their best with us. It is *this* which makes our visits so welcome to the poor, and not, as those who do not know them are so apt to suppose, any material help we may be able to give them. Even the coarsest of them will show us a finer side which "the veil of familiarity" has hidden from the neighbours. When once we have been recognised as friends, it is touching to find how they lean upon us. In sorrow or in sickness they love to have us near, because we understand them and care for them, and so can break through some of the dreadful loneliness they have to endure at such times. Sometimes a poor sick creature is almost deserted. All near relations are dead or away, and every one about him is too busy to take much notice of him. In such a case we become the one link between him and

humanity. "I do not think I could have borne it if I had not had you and your brother to speak to," said a poor painter, who lay dying for months in consumption. He was left literally alone in the world, and being a refined, tender-hearted man, the trial was most bitter to him. To the *old people* our friendliness can be specially welcome. They, too, are so lonely. No one seems to want them, or to have time to look after them ; the pitifulness of some of their lives almost staggers one. Then there are the *young*, the children and the young men and women, all growing up in a homeless sort of way, living in the streets almost from the cradle, and frequenting all sorts of low places of amusement, because home is unendurable to them. Let us, at any rate, give the children some pure and bright experiences which shall help to obliterate the evil ones in their minds. We can send them to stay for a few weeks in the country ; we can have them to our own homes to tea now and then ; we can take them for games to the parks ; we can get the Board schools opened as playrooms for them in the holidays. For the young men and women we can provide social clubs, where they can spend their evenings together respectably and happily. For old and young, men and women, we shall seek in every possible way to provide pure recreation for leisure hours in the week and on Sundays, so that we may enable them sometimes to *forget* the evils which we cannot yet remove, and by social intercourse and restful hours may create for them an atmosphere of *home*, to compensate in some measure, however small, for the *homelessness* of their dwellings.

The forms our helpfulness may take are infinite. When once we have fully grasped what the true needs of the poor are, we shall find ways to satisfy them. Let us go forth like the knights errant of old, to do battle against evil and to help the oppressed. Only, let us not go unprepared ; let us learn to calm our spirits with "that severe content which comes from thought and musing." Only so shall we be able to be of real service to others, and only so shall we be able to hear that "deeper voice across the storm," which

bids us wait in hope and faith "till the day break and the shadows flee away."

The CHAIRMAN thought it would be more convenient before discussing this Paper to have the Paper on "Overcrowding," by the Rev. A. Mearns, and then the discussion upon the two subjects could be taken together.

OVERCROWDING.

BY overcrowding we mean too many people living in a room or house, but the houses may be so placed as not to provide for due ventilation, and wherever this is the case it must be regarded as overcrowding also. The latter, however, is more frequently spoken of as overbuilding, and therefore this Paper will deal mainly with the former, viz. the overcrowding of rooms and houses so as to be highly injurious to the moral and physical welfare of the inhabitants.

At first sight it would seem that the easy way to get at the extent of overcrowding and the locality where it is found would be to ascertain the number of people living in any particular district, and to compare that with the area of the district. The urban average of England is six people to an acre, but places can be found where there are from 600 to 1000 to the acre. There are, however, other circumstances that must be taken into account, for it is quite possible to have the larger number in the space indicated without any overcrowding injurious to health.

We find from the Registrar-General's Return that the greatest density in London is in the sub-district of St. Andrew Eastern in Holborn; next follows St. Anne, Soho; and next Spitalfields. If the districts be taken instead of the sub-districts, Westminster stands first, St. George-in-the-East next; Shoreditch, Whitechapel, and Holborn follow in order.

It will be better for our purpose to select a very limited area, and give details with regard to it.

Take a court with ten houses, and let me give you a description of it as it appeared last week. Looking at the court from the street it would seem as if the houses were nice and clean. Each house has three rooms, and there is but one house with only a single family in it, that is No. 1.

In No. 2, on the first floor, there are a father, mother, and three children, the eldest a daughter of 18, who has a child about 2 years old. In the parlour a man, his wife, and five children live.

In No. 3 there are three families, five persons in each family.

In No. 4 we find an old man with two daughters, the ages of whom are 15 and 17, living in one room.

In No. 5, in one room, we find an old woman, 60 years of age, with her son, 35. In another room in the same house there are five people.

In No. 6 there are two families, five in each family.

In No. 7 there are twenty people in three rooms.

In No. 8 there are four people in three rooms.

In No. 9 there are fourteen people in three rooms.

No. 10, in one room, we found a mother and father and married daughter and her husband, making four people, or two families, in one room. On the first floor there are four people, and in the parlour two, making in all ten for the three rooms.

In the ten houses with three rooms in each, there are two rooms that are unoccupied, leaving twenty-eight rooms with 119 persons, an average of over four to each room.

There is one family living in three rooms, there are two families living in two rooms, twenty families living in single rooms, and two families in the same room, making twenty-five families living in twenty-eight rooms.

The people are chiefly costermongers, and there was a great deal of vegetable matter lying in the court. The rooms are not only used as living rooms and bedrooms, but as store-rooms for flowers, fruit, and vegetables.

This, we are given to understand, is a court which has been taken in hand by some philanthropic people, and is now being superintended by them.

In the same neighbourhood in a top-room we find a family, seven in number, the eldest being a son of 19. In the next room, a mother, son, and daughter, aged 70, 58 and 29, and only one bed in the room. In another room a widow, son and daughter, aged 17 and 21. In another room a father, mother, son and daughter, and girl lodger; the daughter 16 years of age, the son 13, and the girl lodger 15.

In a little underground kitchen live a woman and her daughter aged 22, son aged 15; and a woman and her daughter 7 years of age, lodgers.

In another underground kitchen are a man, his wife, and four sons aged 12, 17, 18 and 25. In the top front-room live a father, mother, and four children, one son grown up, also a single woman with two illegitimate children.

In the front kitchen two families live in one room, one comprised of father, mother, and two children; and the other, their married son and his wife and two children.

The cases that have been given have been taken from London, but other cases almost equally bad may be found in all the large towns and in the rural districts as well.

A great number of most painful disclosures respecting the cottages of the peasantry were made by the Agricultural Commission appointed in 1867, in every one of the agricultural districts, and it has been recently stated again and again that overcrowding is almost as common in the country villages as in large towns, and that it is a common thing to find a married couple with five or six, or even seven or eight sons and daughters of all ages, sleeping in one, or at most two small rooms without any efficient means of ventilation.

The Registrar-General for Scotland in the Census returns for 1871 stated that one-third of all the families in Scotland lived in single rooms. In the report for 1881 he says, "the house accommodation of the people of Scotland has been greatly improved. The number of families residing

in rooms without windows has decreased from 1515 in 1871 to 492 in 1881, and while in 1871 one family in every three had only one room for its habitation, the proportion in 1881 was one in every four." This greatly improved state leaves ample room for further improvement still.

CAUSES.—One cause of overcrowding is *Public Improvements.* There is not a district where there is much overcrowding but you will find a great many houses have been pulled down to make new streets, and to leave open spaces. The people that are unhoused very often herd more closely together, and the consequence is that the remaining property becomes more valuable. The landlord puts up the rent, and families who may have had two rooms are only able to afford one. What has been the action of the Metropolitan Board of Works? Twenty-two thousand persons have been compelled to leave their unsanitary dwellings under the powers of the Industrial Dwellings Acts. Accommodation has been provided for 14,000 of these. Where meanwhile are the 8000? The same causes are at work elsewhere with similar results. In the 'Sanitary Record' for November last we have an article on "The Excessive Death-rate of Newcastle," from which it appears that in the quarter ending 30th September, 1883, the deaths were 27·1 per thousand, being 7·2 more than the average of the twenty-eight large towns. For several weeks it stood highest in the Registrar-General's returns, the maximum being reached during the week ending September 29, when 33 in the 1000 was recorded. The writer says:—"There is a widespread opinion in Newcastle that the principal cause is the crowding together of the labouring classes in the centre of the city, consequent on the demolition of their dwellings by the Corporation to make way for the new streets, without any provision being made for rehousing them. Upwards of 1000 persons have lately been evicted from the Pandon district alone for this cause, and have sought shelter wherever they could, regardless of sanitary considerations. We need not be surprised to find that when a number of people of this class herd together in

a crowded tenement, disease breaks out, and the weakest succumb.

Another cause is *High Rents.* The amount that can be spared out of a labourer's earnings is not enough to pay for two rooms. Where he has to rent a furnished room at 5*s.* or 6*s.* a week he sometimes takes in lodgers at so much a night to help to pay the rent. The amount required to rent a sufficient number of rooms for those who have large families would be altogether out of proportion to the amount of the weekly wage.

There are those too lazy to work hard enough to earn sufficient to support themselves and their families adequately, and there are others who spend in drink what would enable them to provide ample accommodation. Overcrowding is closely related to intemperance, both as a cause and an effect. It often means the diversion of income from rent to supply drink.

In the poorest districts where there is most overcrowding we invariably find an abundance of public-houses, proving that much of the poverty is preventible, caused in a large measure by drink.

There are three districts in Birmingham notorious for their unsanitary condition. In one there are 150 drink-shops, the united takings of which cannot be less than £150,000 per annum. In another district there are 120 public-houses, the annual takings of which are estimated at £130,000; and in a third there are over 100, with estimated takings of £50,000 a year. This is rightly considered to be an important factor, and one that should be taken into account in an enquiry of this description.

Another cause is *Necessity of some workers living near their work.* There are many for whom workmen's trains are of no use. They have to be at work, or looking for work, long before the first train has left the suburbs. Those who attend the early markets must live near. Take Covent Garden as an illustration. Those employed there must live very near, as they have to be at the market at three or four in the morning. So with waterside and dock labourers.

EFFECTS.—*Physical.*—If you enter these rooms by day it is often quite as much as you can bear, but when you enter at night, when the people are in bed, the state of the rooms is sickening, and must be a fertile source of disease. In Glasgow the number of cubic feet required by the Police Act for each person over 8 years of age is 300, and 150 for any less than 8 years of age. There are many cases in London where not more than one-third of this is the space for each person, and sometimes even less. Taking 12 rooms as an illustration, we find them occupied by 45 adults and 21 young children. The total cubic contents of these rooms is 9480 feet. Reckoning 2 children as equal to 1 adult, the average quantity of air to each individual is 170 feet. Is it wonderful that the public health should suffer as the result of such a state of things? We have it on the authority of the late Registrar-General that any deaths in a people exceeding 17 in 1000 annually are unnatural deaths; and Mr. Simon, the Medical Officer of H.M. Privy Council, in one of his reports, states that in England and Wales alone 120,000 persons die every year of preventible diseases, or, in other words, through neglect of sanitary precautions. Dr. Lyon Playfair says, in speaking of Edinburgh and Glasgow in 1874, "If you compare by a simple rule of three relative density of population with the relative mortality of Edinburgh and Glasgow, you will find that the increase in mortality in Glasgow nearly corresponds to its increased density in population." Dr. Farr, at Social Science Congress in 1878, said, "The rate of mortality increases as the density of population increases." Thus, in Liverpool, the densest and unhealthiest district in England, with its 63,823 persons to the square mile, 39 per 1000 died annually. Mr. Ernest Hart, speaking in 1878, said, "It was an established fact that the public health bore a direct ratio to the density of the population. The last case he had under the Industrial Dwellings Act was that of Whitechapel, and no case could be made more striking, because there side by side were two populations living under vitally different conditions. In one part of Whitechapel there was a density

of 744 souls to the acre, and there the mortality was 48 per 1000. In other parts of Whitechapel the mortality was 24 per 1000, therefore it was plain one life in two was sacrificed."

Moral Effects.—These are fearful to contemplate. In one small room, father, mother, young men and women, boys and girls, all live together. Everything is done within the sight and the hearing of all; the whole atmosphere is sensual. There is no place for modesty, and even decency is impossible. Under such circumstances the wonder is not that things are bad, but that they are no worse. Wherever the vicious and degraded crowd together, they form a hotbed of debauchery and crime. It is a mistake to suppose that the dispersion of these will spread disease and crime. Scattered, many are compelled to lead honest lives and work hard to their own advantage and that of the community. Captain McCall, of Glasgow, gives valuable testimony on this point in his Report for 1871: "I would consider I fell short of my duty in this Report were I not to acknowledge that the operations of the City Improvement Trustees and the Directors of the City Union Railway have contributed to the results. Through these operations the city has been cleared of the foulest dens of crime and profligacy, and their occupants have been scattered amongst a population breathing a purer moral atmosphere, thereby affording facilities to the police for bringing the vicious to justice more easily and certainly than when the whole formed a concentrated and combined colony of ruffianism."

REMEDIES.—*The Registration and Inspection of all Property let out in single rooms.*—The registration should include information as to owner and the number of persons that may be accommodated. In the Glasgow Police Act there are clauses providing that any person appointed by the Board may from time to time enter any dwelling-house which consists of not more than three apartments, for the purpose of measuring in cubic feet the space contained therein, and to mark on or over the outside of the door of any such dwelling-house, if the cubic contents thereof do

not exceed 2000 feet, the number of such cubic feet and the number of persons exceeding the age of eight years who may sleep therein. The number is fixed in the proportion of one person of the age of eight years or upwards for every 300 cubic feet of space, or of one person of an age less than eight years for every 150 cubic feet of space contained therein. In the draft of the new Bill the number of cubic feet for each person over 8 years of age is increased to 400.

These houses are known as "ticketed houses," and four inspectors are placed on duty three nights in each week from 12 till 2 in the morning for the detection of overcrowding. A ticketed house may or may not be a lodging-house, and contains not more than three apartments. The Sanitary Inspector of Glasgow, Mr. Kenneth Macleod, testifies to the beneficial effect of such inspection, and that the complaints because of the visits at midnight have been very few. It is a hardship for those who in no way infringe the law to be disturbed at midnight, but it is only one of the hardships of the poor, and house-to-house visitation appears to be the only way of overtaking offenders. The powers are extraordinary, but there can be no doubt as to their necessity, nor as to their efficacy and usefulness. The officers, moreover, will soon come to know the respectable people, and carefully avoid disturbing them. It seems to me, however, that something more is needed than simply so many cubic feet for each person. No two families should be allowed in a single room. No family living in a single room should be allowed to have a lodger. No family should be allowed to occupy a single room if any of the children are over 12 years of age.

The Erection of Artizans' Dwellings.—If freeholds could be secured it would then be in the interest of the owners to put up houses that would last, and keep them in thorough repair. This is done on a very large scale by the Artizans', Labourers' and General Dwellings Company, Limited, and the results are in every way encouraging and instructive. This company secures a freehold estate, on which it erects

dwellings of various sizes, with of course varying rentals, but not over 2*s.* a week per room. They are well built, well drained, well ventilated, thoroughly adapted for the class for whom they are designed—they are seldom vacant, and pay a good dividend. There is no reason why this cannot be done on a far more extended scale, provided always that the difficulties in the way of getting freehold sites at reasonable rates are removed. Substantial healthy dwellings at rentals that are not prohibitive will not lack tenants in London.

It may be said, however, that these houses are situated in the suburbs, and that the problem of providing suitable homes for those who must live in or near the City, because they cannot afford to be far from the scene of their daily toil, remains to be solved. But if freehold plots could be secured, surely companies could be formed which should pay at least 3 per cent. dividend. A writer in the 'Building Times' says that 6 per cent. is possible, and that too on leasehold land. He is dealing with the requirements of those who cannot afford to pay for more than a limited space, one or at the most two rooms.

Miss Octavia Hill warmly advocates the formation of such companies, and it is well known that in spite of difficulties which to many would have been counted insurmountable, that lady has now under her supervision blocks of houses which prove the possibility of doing much for the very poor in this direction. And these houses pay. Miss Hill writes, "I have no hesitation in saying that if a site cleared under the Artizans' Dwellings Act were handed over to me at a price such as that usually paid by one of the large companies or builders for it, I could accommodate on it a large proportion of the very poor, providing them with all that is essential at rents they could pay, and which should yield a fair percentage on the capital expended."

Mr. Francis Peek suggests power being given to a central authority to clear sites and build on them not artizans' dwellings alone, but also shops, &c., connected with them, and for Government to advance money for this

purpose at the lowest rate of interest possible without loss, and with no restrictions save such as should be absolutely necessary for the protection of the ratepayers. At present, when clearances are made, they involve such a loss, partly from the restrictions as to building, partly from the excessive sums paid for property compulsorily acquired, that they are not popular.

The question of emigration requires very careful consideration. Who should be helped? How can help be best rendered? To what colonies should emigrants be sent? Time forbids that I should do more than simply mention the matter and leave it.

DISCUSSION.

Mr. E. HEPPLE HALL said one very important matter was what became of the 56,000 people that every year were turned loose in the streets of London? He maintained that no reasonable amount of extra accommodation would accommodate that, and other large contingents which were forced upon them from time to time, and that it was only in emigration that they could seek sure and speedy relief. Dr. Longstaff had stated that something like 1,179,000 people came from other parts of England and Wales, and if that number outside of London were actually to be found in London at the present day, it went very far to prove that they had constantly coming among them from the suburbs and provincial towns one-third to one-fourth of the population. If that were to go on, no relief would be found which was adequate to their wants and necessities, except emigration.

Mr. FREDERICK KING said there were two things in Dr. Longstaff's paper which were extremely contradictory, viz., that the country sent all its population away, and tilling the soil was necessary for large towns, and the ques-

tion was whether that state of things should continue. As to the question of overcrowding, he might mention that in one house in the west end of London he found in one room, about ten or eleven feet square, a woman of eighty-two and her niece and two grown-up sons. Such a thing was a disgrace. During the last ten years not a single farmhouse had been built in the country, and scarcely one repaired. If this state of things was altered people would very soon return to the country. The remedy was in the hands of those who took an interest in the question, and sooner or later he thought they would see that the land of the country must be cultivated.

Mr. CHARLES FORSTER HAYWARD, F.S.A., said the few remarks which he had to make had a bearing upon the first and third papers. His attention had been directed to the subject under discussion, not only on account of his personal interest in the housing of the poor, but also owing to his holding an official position to one of the districts central and well known in London. Various circumstances had directed his especial attention to some parts of this neighbourhood in the years 1871 to 1874 and 1875. The working of the Building and other Acts eventuated in the closing and pulling down of certain groups of dwellings owing to their dangerous or unsanitary condition. This again was followed by improvements in the same neighbourhood, resulting in a measure from this original movement. Further action was taken as time went on, and another wave of improvement followed, and this was repeated, so that acting and reacting, pulling down and rebuilding—the rebuilding always of a warehouse character, while the pulling down were mostly dwellings—an ebbing depopulation set in, which had the disastrous effect of unhousing the poorer labouring classes, and causing overcrowding, not only in the district itself, but in the neighbouring ones also. This ebbing tide of depopulation, however, extended there also, and many of the poorer dwellers were driven out from their new homes by causes similar to those which had brought them there, and were hunted out of the dangerous

and unsanitary dwellings of Bedfordbury by the same Acts of Parliament which had driven them from the neighbourhood of the Seven Dials and Barley Court, St. Giles'. This movement went on until after the passing of Sir Richard Cross's Artizans' Dwellings Act, which enabled a large scheme of demolition to be entertained and carried out, so that a considerable clearance was made in the neighbourhood of Drury Lane, disturbing a large and closely packed population, though not without considerable expense to the ratepayers. On this site so cleared at the cost of the ratepayers a large group of Peabody Buildings had been erected with the result of rehousing about half the number of the former population, but none, he believed, of the original occupants of the site. These people were all dispersed, though no one knew precisely where. As to the population per acre, he thought Mr. Mearns was very much within the mark in the figures which he gave, because in one of the courts with which he was acquainted he knew there were absolutely over 2000 per acre. On the site where the Peabody Buildings now existed in Drury Lane there were formerly 2734 persons, being 2160 to the acre, though the number accommodated in the Peabody Buildings was about half the number. In Little Coram Street the buildings which had been erected in like manner would only accommodate half the number of the former inhabitants.

Mr. THOMAS HUNTER (of the Mint), as a working man, did not think this was a question which should be entirely handled by people above the working classes. He had long been of opinion that if you want to cure the terrible evils, you must do away with overcrowding. He knew the habits and customs of poor people, having lived for many years amongst them, and he was present that day to say that the evils of overcrowding almost made one shudder. Some of the most terrible things, which could not be mentioned in public, were the results of overcrowding. If they wanted to cure horrible London, they must begin by going to work upon the children ; and he

would say to all persons who loved humanity, turn your attention to the children, and try to teach them a brighter and happier life. It had been his lot to spend some sixteen or seventeen years in London, and during that time it had been his lot to see the baby in arms grow up to be an outcast of society, and perhaps to become a criminal. There was no chance of these poor children becoming honest and sober, owing to the intemperance of their parents. The one great withering blight and curse of the working man of London was the public-house; if they could only induce the publicans of London to emigrate, or the people not to go into the public-houses, the evil to which he had referred would be removed.

The Rev. G. W. McCREE said that for twenty-five years he had spent his life amongst the poor of St. Giles', having visited some tens of thousands of these people, and the opinion to which he had arrived was that the principal cause of overcrowding must be attributed to the public-house. That was the state of things all over London and England. In one part of London they had a block of buildings containing 1082 families, and 2153 children of an age to go to school, and in connection with that block of buildings there were 3 schools, 2 churches, 2 chapels, and 41 public-houses—a public-house to every 25 families. He thought it was a scandal and a shame for the licensing magistrates to have planted so many public-houses in the neighbourhood. Taking another part of London, the following would be found to be the case—a population of 400,000 people—the expenditure per head on education was 4*s.* per year, and on drink 11*l.* per year. Many public-houses were to be found in the poorest and worst parts of the neighbourhood, some of them being the property of leading Christian men in London.

If they did not go to the root of the matter, they might build houses for ever. In 1862 he was requested to write a work upon the condition of the poor, for the Social Science Association; and, taking the streets radiating from Seven Dials, he had a diagram prepared showing the

different public-houses. This diagram he submitted to a surveyor of one of the greatest brewing firms in London, who told him that the amount of money spent in those public-houses—26 in number—was about 53,000*l.* a year. If, instead of spending the money in the public-house, it was spent in improving the homes of the poor in Seven Dials, a great deal would be done. You could never improve the homes of the working classes unless you got rid of the public-house.

The Rev. STYLEMAN HERRING said that as a rule people who had lived for some little time in London either for good or evil got to love the place, and they did not like to leave it. He had had some experience upon the emigration question, having assisted a great many persons to go to Canada, and his experience was that Londoners made very good colonists. He hoped that some day or other the State would take up the question of emigration, and not leave it to private individuals.

Mr. ANDRESSON, who had had the care of English boys for over twenty-five years, was of opinion that the only way to keep them out of mischief was to give them room for play, and this could only be done by utilising the open spaces in London. In Switzerland, where he had lately been, the open spaces for the people were left open, but he noticed in London that the open spaces were enclosed with iron railings.

Mr. FRANCIS said he had listened with a great deal of interest to the speeches which had been made, and with all due deference to the gentlemen who had spoken, it seemed like Dives alone legislating for Lazarus. If the discussion could be continued on some future occasion, Lazarus might have an opportunity of speaking for himself.

Mr. JOHN HAMER, the Hon. Secretary, in moving a vote of thanks to the Chairman for presiding, said the discussion of the papers could not be adjourned, but the papers to be taken to-morrow were of a similar character, and Lazarus would then have an opportunity of being

heard. He was sure every one wished that both sides should have a fair hearing.

Mr. BLOMFIELD, in seconding the motion, suggested that those interested in this subject should get the Blue Book which had just come out, in which Mr. Samuelson's name figured conspicuously. The gentleman who had spoken about Lazarus would, he thought, derive a great deal of information from this book.

The vote having been unanimously passed,

The CHAIRMAN said that, having been compelled to curtail the time allowed to the speakers, he should be indeed acting very improperly if he were to discourse at any great length. He thought they were much indebted to the gentlemen who had read the papers, to those who had taken part in the discussion, and to those who had organised these meetings. It was clear that to remedy the evil complained of you must probe to the bottom, and that was the matter upon which many persons were now engaged. He was glad to see that many persons took an interest in the question, and that ladies were interesting themselves in the matter, and bringing to bear upon it all that kindness of heart and practical philanthropy which so distinguished them. The paper by Miss Toynbee was a most valuable one, and had brought home to them a most pathetic picture of the difficulties under which the poor laboured in order to provide for their surroundings, he would not say happy, but decent homes. There were hundreds of workers ready to associate with the poor to make friends and companions of them, and if this did not put a stop to overcrowding and misery which the poor suffered, it would be a valuable palliative for it.

Conference on Thursday, June 5, 1884.

His Grace the Archbishop of Canterbury in the Chair.

1. "*Suburban Dwellings and Cheap Railway Fares.*" By James Hole, Esq.
2. "*The Treatment of the London Poor.*" By Miss Lidgett.
3. "*On the Creation of a Building Fund.*" By H. D. Harrod, Esq.

SUBURBAN DWELLINGS AND CHEAP RAILWAY FARES.

The housing of the working classes has assumed a degree of importance it never previously possessed. We have suddenly awakened to the fact that our highly-developed civilisation may be confronted by a barbarism threatening its existence, and at least depriving large numbers of its commonest advantages. To what end, so far as they are concerned, the enormous growth of wealth, of art, science, literature, if they leave them untouched by any beneficent influence? The barbarism that nearly overwhelmed ancient civilisation was external; our danger is from within, almost at our doors.

The problem demands a two-fold solution: one immediate, urgent, and not to be set aside; the other the future, with which I more especially wish to deal. As to the present necessity, it is admitted that existing sanitary legislation, if vigorously enforced, would remove many of

the grossest existing evils. But the prospects of such enforcements under vestry government are not encouraging. Many of their members are nuisance makers; it would be idle to expect them to remove nuisances. In one of the largest and worst districts of London (Whitechapel) the sanitary laws have not been enforced for eighteen years. The district surveyors, whose province it is to prevent improper construction, would, if they instituted a prosecution, do it at their own risk—not a very likely way to encourage them in the performance of their duties. The letter to the vestries by the President of the Local Government Board, Sir Charles Dilke, intended to call them to a sense of their duty, has been ignored, except where it has been publicly rejected.

So much for the present. As to the future, grant that the existing sanitary laws were adequately enforced, that the best is made of existing dwellings, that a large increase may be obtained of the one-room and two-room accommodation, which some people think is all that can be desired, it would not meet the fast increasing exigencies of the case. Already half the children of the Board schools belong to families living in one room. The increase of the population of London is about 50,000 per annum. All the efforts of benevolence in the past twenty years would scarcely provide the accommodation required by one year's increase. The limited space in London proper permits only of the block system for the growth of population. It is a palliative well adapted for dock labourers, costermongers and others whose earnings are extremely small, and who must be on the spot where their labour is required. It has also shown itself well adapted to the needs of the wealthy, who do not want the responsibility of large housekeeping, and who can migrate to the Continent, the country, or the seaside, when weary of their town residence. But, as applied to the working classes, I think the cottage dwelling outside London, where the tenant can have a few yards of garden, breathe pure air, and cultivate the home feeling such as he can never experience in buildings

constructed with the aspect of a barrack or a workhouse, is a better solution. In them the sense of comfort and beauty is ignored. A city composed of a large aggregation of such buildings would be a mournful spectacle.

Political economy teaches that the habits of a people improve or degenerate in harmony with their surroundings. The man who is content to marry with a one-roomed dwelling, to have a family there, seldom acquires the energy to emerge from it. As Mr. Walker some three generations ago expressed it, "If empty casks were placed along the streets of Whitechapel, in a few days each of them would have a tenant, and these tenants would keep up their kind."

Without wishing to propose Utopias, I do not think a city of tall blocks filled with one- or two-roomed dwellings is a satisfactory ideal for the next generation, or that the kind of existence which it represents should be the horizon of our hopes and aspirations. I will suggest nothing but what has been actually accomplished, and that on a large scale; and that, though taking a high yet practicable standard, we should prepare for the future while it is possible to do so.

The example I refer to is the enterprise of what is known as the Artizans' Dwellings Company, especially their latest achievement called Noel Park. The work of this society is far too little known. Its objects, as stated in the last Report, are—

"The acquisition of freehold estates in the near suburbs of London, and the building thereon small separate cottages for artizans and the working classes generally. The Company has completed estates at Shaftesbury Park, near Clapham Junction, of about 1200 houses, and at Queen's Park, Harrow Road, of 2170 houses. They are now engaged in developing a still larger estate, Noel Park, near Hornsey, on the north of London, which when completed will consist of over 2600 houses. The houses are of five classes, at weekly rentals ranging from 6*s.* to 11*s.* 6*d.*, and a few specially-built houses at higher rentals. These rents are inclusive of all rates and taxes, including water.

"The houses are eagerly sought after by the most careful and thrifty of the working classes."

These dwellings, especially the latest, are tasteful, convenient and cheap. Public-houses are excluded from the estates, and are opposed, as far as practicable, in the neighbourhood. This, no doubt, prevents the diversion of wages now paid for rent, to less advantageous uses. Clubs, flower shows, cricket and play-grounds, form part of the arrangements.

Now that which has been done at Shaftesbury Park, Queen's Park, and Noel Park, realises to a considerable extent what should be done all round London, in connection with all the main lines of communication, extending it mainly on the following points from the methods of the Artizans' Dwellings Company.

1st. Its extent. To meet the growth of population, it is needful that such model villages should be created all around the circumference of London. But to do this, the land for the purpose should be secured before it is *too late.* Every year the available land is being taken up by private speculation, and the motto that is so often written on our social history, "Too late," will have to be inscribed here also. Some power should exist to take such lands at a fair valuation, the same as now exists for railways, or other public purposes, sanctioned by Parliament.

2nd. To the success of such suburban villages there is one condition precedent, viz., that the railways should be *induced* to afford adequate facilities at reasonable rates. The abolition of the tax on railway passengers might be yielded for the concession. The bill for extending the powers of the Railway Commission will err greatly if it does not include one to enable them to regulate the fares in the direction indicated. The so-called workmen's trains do not meet the necessities of the case, and are not even convenient for the railway companies themselves. The workmen need the same opportunities as the ordinary season-ticket holder. To save the railway trouble, the ticket might be combined with the rent. But the whole system of fares will have to be revised. The Report of the annual meeting of the Artizans' Dwellings Company shows

that on the Great Northern Railway, while the fare for the first-class season-ticket holder (from Hornsey to King's Cross) is 6*d.* per day, the poor man must pay for his third-class 8*d.* The Great Eastern charges the first-class season-ticket holder (Green Lanes to Liverpool Street) 8½*d.* per day, and the *third-class* paying daily 10*d.* per day, or by monthly tickets at the rate of 3*s.* 1½*d.* per week, while the total rent, taxes and water, is 6*s.* per week, or above 50 per cent. for transit merely. It is satisfactory to find that the Midland Railway acts in the same liberal spirit it has manifested in other ways, and charges the workman's season ticket (Harringay Park to St. Pancras) at the rate of 1*s.* 5*d.* per week. If the Great Northern charged in the same proportion, the Artizans' Dwellings Company could erect six hundred to eight hundred dwellings yearly on the Noel Park Estate, and, as the Chairman, Mr. R. E. Farrant, said, "enable thousands to live and work out of town, and leave the slums in which they are forced to herd at present."

A deputation from the Artizans' Dwellings Company waited on the Directors of the Great Northern Railway and stated this grievance. The report then presented concludes as follows :—

"It is quite impossible to relieve the overcrowding of the working classes in London by the removal of the best of them—not necessarily those receiving the highest wages—but those who appreciate a home with all its associations and elevating influences, unless the facilities given to the first and second-class passengers are also given to the third-class passengers.

"The railway companies have in their hands the power to develop a traffic which would be enormous, which would be remunerative, and which would more than anything else solve the difficulty of overcrowding so far as regards that immense portion of the working classes who would live in a home, only obtainable in the suburbs, if they could get to it."

The 3rd, and in my opinion the most important extension required, is that the dwellers in these model villages should be encouraged to become the owners of their own dwellings. The Artizans' Dwellings Company commenced

with this as one of its objects, but it has abandoned it, and now it is simply an investment for capital, beneficent it is true, but falling short of the highest attainable advantage. Of all the methods of benefiting the working classes, there is none more effective, none more successful, and, at the same time none so easy, as permitting a man to purchase his house by payment of the rent. Building societies have largely popularised this idea, and aided its realisation, and tens of thousands of working men owe to those excellent institutions their first step in social advancement. But the building society does not build, it only lends the savings of those who do not build to those who do. Being in each case an individual enterprise, the building society exercises little or no control over the conditions of the dwelling beyond seeing that it affords adequate security for the mortgage, and hence many neighbourhoods of large towns have scores of unsightly dwellings of all sizes and shapes arising around them.

In Birmingham, in Leeds, in Halifax, thousands of working men now possess their own houses. As a mode of saving, the building society stands above the savings bank. As Mr. J. Taylor stated it, "*2s. 6d.* per week for 12 years in a building society would be 120*l.*, in a savings bank, 92*l.* The 92*l.* would have to remain 11 years to make 120*l.*, while the 120*l.* if left for the same period in a building society would be 256*l.*"

The objection of the Artizans' Dwellings Company to sell the houses is in the fear of the middleman. They say, "We believe that the Company is the best trustee for the working man, better than the working man himself. We have felt that if we sold houses it would be very difficult to prevent them getting into the hands of the middleman, and that the benefit which is secured to the working man would be swallowed up by the class with which we have no sympathy, and for which we never proposed to work."

The objection could be met by not allowing any one to possess more than the house he inhabited, and in all cases to give him a preference over the mere investor. Con-

sidering the incalculable importance of inducing provident habits, some risk might be incurred, and the leaseholder should have power to enfranchise his lease. The same law that protects the property of the Duke of Bedford and his trustees from being diverted to other than the intended purposes, will protect the property of the working man.

To carry out this object I propose the creation of a paid Government Dwellings Trust, comprising the most practical men that can be found, who should have granted them all the necessary powers to carry out the proposed working-class model towns. The funds would be derivable from three sources :—

1st. Capital loaned by the wealthy, and those desirous of ameliorating the condition of our town population. Debentures bearing interest at $3\frac{1}{2}$ per cent. on such undoubted security would largely be taken up.

2nd. The contributions of the working classes themselves in the repayment of the mortgages, and which would in a few years replace most of the capital.

3rd. The above might not be found adequate, and in that case the Government might loan the requisite addition. The price of one first-class ironclad is from half to three-quarters of a million. Let the price of one such ship be yearly thus devoted as a basis for other capital, and which would more than double it in amount, and a marvellous revolution might thus be effected. The Government holds above 80,000,000*l.* of the savings of the people, and would need only to lend a small fraction of that sum, for which it pays them through the Post Office and the ordinary savings banks $2\frac{1}{2}$ and 3 per cent., at $3\frac{1}{2}$ per cent., to cover expenses of administration. The capital thus advanced would enable the Dwellings Trust to erect its dwellings at so cheap a rate as to bring them well within the means of the better paid portion of the working classes. The capital would be continually replaced by the repayments of the purchasers of the houses, while the existing inferior houses thus available would afford accommodation for the still lower grade of the poor. The transfer would render possible many of

those necessary clearances and improvements which, as now carried on, inflict incalculable misery on the lowest classes of the population.

As an illustration, on a very small scale, of what may be done in this direction, I may cite an example originated in Leeds. A few persons purchased small plots of land in different localities, and erected good and convenient dwellings upon them. The working men were invited to purchase them on the condition of finding one-fifth of the cost, and the remaining four-fifths was lent by an excellent building society in the district. The working men were enabled to become the owners of the houses in thirteen years and a half by payments equal to the rent they would otherwise have paid to the landlord; but the difference was this, that, at the end of the thirteen and a half years, the house, instead of being the landlord's, was the purchaser's own property. While the purchaser of the house had every motive possible to pay off the debt upon his house and become the owner, he felt that every shilling he paid was a diminution of his debt, besides only paying about half the sum that he would have had to pay to a landlord merely as interest.

Less than 20 years since, at Halifax, those true "Captains of Industry," Messrs. Crossley and Edward Akroyd, erected model villages, and permitted their workpeople to purchase their homes. At West Hill Park, the total advances to 182 borrowers were 43,730*l.*, and at Akroydon, to 70 borrowers, 13,953*l.*, all of which have been repaid, and the title-deeds are in the possession of the borrowers. The Secretary of the Leeds Permanent Benefit Building Society assures me that within the last 10 years "not less than 600 houses have been so obtained under the value of 300*l.* each."

The majority of working men could not even find the small sum of one-fifth, as in the instance previously mentioned at Leeds, but there is no reason why the whole sum for the purchase of the house should not be lent them, as the house would not be conveyed till paid

for, and every week's payment would diminish the amount due on the mortgage. Preference might be given to those who could afford to find some of the purchase-money.

Working men are not familiar with the details of business, and cannot very well organise such schemes themselves, but if facilities are found, they are very willing to avail themselves of them.

It may be objected that working men change the localities of their employment too frequently to render such a scheme possible. To meet this objection there might be two rates of rental—one a tenancy rental, and one a purchasing rental. In case a man should lose his work or have to leave the locality, he would have the difference between the higher and the lower rental returned to him, and thus he would derive all the advantages of a savings bank.

If these workmen's dwellings were largely erected in different districts outside London, they could be built with great economy, and many of the advantages of co-operation, such as libraries, stores, and so on, could be made available for them ; the dwellers would have the advantage of sleeping in purer air, and be free from many of the evils which accompany residence in London.

The ordinary laws of supply and demand will neither furnish the right kind of dwellings, nor do it adequately. Capitalists like neither trouble nor risk, and working-class tenants create both. The greatest demand is for the smaller class of houses suited to working men's means and necessities, but this is not the class of dwelling that has been or will be built, but instead, there has been a great excess of middle-class houses, and at this moment there are vast numbers of such untenanted on all sides of London.

If it is wise, as I think, to assuage the "Bitter Cry" of Ireland by a loan of twenty millions, it cannot be unwise to alleviate the "bitter cry" of a population equal in number, by a fortieth part of that sum to be repaid in half the period. If the phrase "horrible London" can be

tolerated now, what may we expect when at no distant period the population has grown to six or seven millions, unless we provide for the future?

In a Paper limited to fifteen minutes, I can only give a sentence or two to other remedial agencies. From Dr. Longstaff's valuable Paper yesterday it appears that one-fourth of the population of London is due to immigration, and no doubt a similar proportion holds in other large cities. It has been shown that the rural population, driven by the misery of their present condition to the towns, have not only increased the pressure for dwellings and employment, but often exchanged a bad condition for a worse one. If this be so, it is obvious that one remedy would be to make the country a more desirable place to live in than it is. Let the land be more fully cultivated, the dwellings of the poor be made as good (or nearly so) as the stabling for the horses, and let them not be sacrificed in the interests of game preserving. If this is too "incendiary" a proposition, at least let all reasonable encouragement and facilities be given for the migration of our surplus population to our colonies. Low wages and badly spent wages lie at the root of most of the social evils which all good men now deplore. If we look forward and provide for the growth of population, we can accomplish what is desired in an orderly, systematic way, and avoid a great amount of loss and misery which will otherwise be inevitable. Let this be accompanied by other civilising agencies. Do not moan over the high school rate, but vote its increase until every child, however poor, is effectively reached, and let the education given have a more direct bearing on the conduct of life, in lieu of much of the less useful things now taught.

Then, too, give all possible facilities for the rational amusement of the people, and at the hours when they are all able to enjoy it. Diminish, if you cannot remove, the temptations to noxious expenditure. And, on the other hand, give every possible inducement to thrift in lieu of

the demoralising charities with which so many well-meaning people satisfy their consciences, and shut out further consideration of our social evils. Perhaps the result of these combined agencies will result in proving that the working classes are not worse than other people, have the same human nature, and are as much amenable to better influences as any other class of the community.

THE TREATMENT OF THE LONDON POOR.

By the poor I understand those working people, not necessarily paupers, who are yet unable to secure for themselves the decencies of life without the active interference of public authorities or philanthropic persons. In speaking of their treatment I must limit myself to those particular modes of dealing with them in which I have myself had the most experience. But I hope it will appear in the end that whatever method be adopted, its principle should be that of rousing the energy and respecting the independence of those whom we would benefit, of not merely doing good to the far-off "masses," but of bringing the strong into personal relation with the weak, and of maintaining this relation when the excitement of forming schemes and making a beginning has passed away.

Any one fresh from exploring continental towns can hardly help feeling an amount of shame and sadness, as he walks along our streets, at meeting in this rich city men, women, or children in dismal rags and dirt, such as he has not seen elsewhere. Follow these people to their homes. Close to the broad highway you pass into a narrow court thronged with children, regardless of the School Board, playing at all hours of the day and far into the night. Women stand airing themselves and talking on the door-steps by the hour together. Boys are playing "pitch and toss," ready to stop at a moment's notice if the policeman

appears, ready to renew their game the moment his back is turned. You go into the dark passage of a house, up a dark and much-worn staircase. The plaster is ready to fall from the ceiling and walls, or possibly the walls are held together by layers of paper accumulated during the last fifty years. Go downstairs ; you are haunted by fears of poison from the drains. The drinking water is in close communication with them. Rats escape from them to roam at large over the basement. The dust-bin is full to overflowing. You hardly dare to think how you could live for twenty-four hours in these surroundings, your staircase tenanted at night by homeless strangers, your sleep disturbed by shouts of laughter or fighting, mingled with foul language, from the court outside.

Within the last few months every possible remedy has been suggested for the ugliness that shocks our senses, an outward and visible sign of a deeper degradation. And I may here say that there has been rather more inspecting and reporting than was for the good of the people themselves.

To any one really trying to grapple with this state of things, one striking feature is the want of hope in all those most immediately concerned. The friendly visitor exhorts some one to give up intoxicating drink. But how can you drink water from a cistern constantly exposed to foul air, or filled with old hats or boots ? Or he suggests that a scrubbing would make the staircase sweeter. But what is the use if no one else will take a turn ? You talk to the landlord. Perhaps he is a hard-working man who has saved money in a shop, and has unfortunately invested it in this low class of property. He complains that if he repairs the wall it is broken, grazed, and dirtied ; that if he puts his cistern in order, cabbages are washed in it, or refuse thrown in ; that if he puts good drains, they are blocked with flannels, brushes, forks, and spoons, and that altogether the work is ruinous, and he will do nothing but what he is compelled to do. You look for the sanitary inspector. By the time he has come to work so humble as this he seems

to have lost both sight and smell and power of speech, which he only recovers when he finds an improving landlord, on whom he duly serves his notices. Last of all, you ask the police to interfere against disorderly conduct in the court. They wish the place were pulled down, and the people turned adrift. All the way round we seem to be entangled in a system of broken contracts.

The impulse of those who can afford it is to take the place of the negligent landlord, and where they see one court worse than another, to buy it up and put it in order. This is an impulse apt to be traded on by unscrupulous owners of such property. Yet in this is the greatest hope of improvement. I think the first step towards a widespread improvement will come through the vigorous and continued action of the Sanitary Aid Committees lately formed under the Mansion House Council, calling upon the vestries to carry out the law, and so forcing landlords to keep their houses in a decent and wholesome condition, that they will find it impossible to reap the high percentage of which they have sometimes boasted, and that they will find them less easy to part with as a profitable investment. Wherever a place can be bought on reasonable terms, and a staff of workers can be depended on, great good may be expected to follow.

The work of which I propose to speak more especially was originated by one who perhaps more than any man has opened the eyes of our generation to the heaven of beauty that lies around us, whose words of living truth have at the same time rebuked our selfishness and banished the "shades of the prison-house" as they began to close upon us. It was Mr. Ruskin who, with Miss Octavia Hill, first thought out this way of helping those whom his words might never reach, and who first ventured a considerable amount of money on the experiment. Model dwellings were already being provided for artizans, when Mr. Ruskin suggested taking some houses as they were, and restoring them by degrees to be fit habitations for tenants of a humbler class, who at the same time should

be taught how to live in them, and how honestly to pay for them. We all know how this plan has succeeded in the hands of Miss Octavia Hill. It is not a matter of mere bricks and mortar, of plaster and whitewash, that can be ordered or inspected by public authority, though greater activity of the public authorities would do untold good both in these things and in preventing overcrowding. It is a work that must for the most part be done by ladies. It involves exact and continuous attention to details, and the full acceptance of business responsibilities. But it is above all personal. It is said that to know any one truly you must have money dealings with him. The rent-collector has thus an acquaintance with the poor such as no one else has. Opportunities of gaining personal influence come in the routine of business more surely and more often than in any desultory visiting, however high the motive of the visitor. It is important to remember the difference between the ordinary collector who is paid 5 per cent. on his collection and the collector who is also visitor and friend. The ordinary collector has the advantage in his knowledge of the law and his practice in dealing with tricks of all kinds. But he could not afford the time for patient personal dealing even if he thought it worth trying. He must earn his living, and it cannot be earned if he gives too much time to his work. He is further tempted to shut his eyes to the character and conduct of a tenant if only his rent is regularly paid. The collector who is to do more than this must be at the same time hopeful, sympathetic and practical. She may be looked upon with a mixture of dislike and amusement by those accustomed to collect rents, who complain among themselves that she is taking the bread out of their mouths. The poor people themselves will be slow to perceive the benefit of paying money to a lady, and they will not abound in expressions of thanks, however much she may spend in repairs. The successful manager will not be daunted by anything. She will begin with an exactly kept rent-book, with strictly enforced rules of decency and order, and with the prompt carrying out of

necessary repairs. She will watch for every opening for work, sometimes giving work in the court to the unemployed, sometimes recommending to employers tenants who have given sufficient proof of honesty and power to work. Where there are growing up daughters she will urge their going away to service. For several years past invaluable help has been given us by the Metropolitan Association for Befriending Young Servants. Again and again mothers have said, "I should like my girl to go right away to service if I could only get her clothes to make a start; for she will only come to harm in the court." I have assured them that if they went to the Hon. Secretary for our neighbourhood she would give them everything needful, to be repaid according to circumstances out of their future wages. In many cases the attempt has been made, or the girl has been sent to a Training Home for a few months: anyway, a start has been given. Many have been the failures. But the successes have been worth all the trouble. Every year of this Society's working shows the parents and younger girls more examples of those earning a respectable and comparatively affluent living, and we have the satisfaction of so far reducing one of the most serious evils of overcrowding.

Time will not allow me to speak of other workers and other modes of working to which we are deeply indebted. We may be sure that the fuller and more frank the understanding between those working on different lines, as long as they are true and honest, the more fruitful in every way will their work become.

To return to our rent-collecting. For a few hours every week ladies forsake their ease and their ordinary acquaintance, to arrive punctually at their place of work in all varieties of weather. They bring with them the habits of courtesy and consideration that they practise at home. They know instinctively that patronage is not wanted and would not be understood, and they do not wish to give it. They come to teach. But they also learn, as they try to measure the difficulties against which their tenants have

to contend. With glad surprise they come upon a room here and there clean, bright and orderly, perhaps adorned with pictures, or with window plants—geranium, musk, and creeping jenny. Again, they cannot but admire the brave unmurmuring struggle kept up by a widow, or by one whose husband is ill or out of work, often in the face of ill-health and bodily discomfort, and sometimes of ill-treatment. Among the men also they find a manliness and good sense that they had not expected. As the years go on they are conscious of having won a trust and loyal affection that go far to make them forget disappointment and failure.

I am constantly asked what I do in the case of a tenant who does not pay, or who is incorrigibly disorderly, and what is to become of those who are ejected? I can but answer that my first consideration must be for those who remain. If the bitterest hardship of the poor is that they and their children must live among the vicious; if our hopeless slums are created by the unrestrained disorder of those who live in them, surely it is the imperative duty of those who manage a court to separate and eject those who persist in vicious ways. And we may have the modesty to think that ours is not the only spot of earth where the ejected may begin a better life. We cannot tell how great are the hardship and contamination of being forced to live in close and frequent contact with dirty, drunken and immoral neighbours. Again, where tenants are carefully placed together, they help each other to good every day of their lives. The kindness, trust, and fellow-feeling that grow up of their own accord bring more happiness than anything we can do directly. And if children can be protected from evil, it is in such a little company of hard-working, well-meaning people as we have the power to bring together.

The manager of a court may not be able personally to do nearly all she desires for the people; but she will watch with the keenness of one pushing a business for those willing and able to help, either with a men's club, a

mothers' meeting, a savings bank, or a library, or in visiting the sick.

One cheering feature in the freshly awakened interest in the poor is the increased willingness of those able to do it to give concerts and other entertainments. They are always welcome, and the performers will hear "Lazarus" laugh more heartily than the rich man knows how to. Let them only be sure that they are in sympathy with their audience, and they need never stoop to the vulgarities that ruined our Penny Readings a few years ago.

The subject of temperance is too large to enter into here. Every worker among the poor, who sees the havoc of all that makes life worth living, is driven to something like a personal hatred to intoxicating drinks, and to amazement that the trade in them should not be restricted and watched over with the kind of care taken against other poisonous drugs.

It is often said that the poor do not want religion. They want something cheerful, something practical, something to eat. They will not put up with religious conversation unless with the hope of a grocery ticket. Would it not be better to desist from one or the other, for the combination is simply poisonous? I fear it would be a hopeless task to teach subtleties of theology or exactness of Church order. But I have been in little gatherings of poor people, and have seen them listen with eager interest while some one spoke to them in words simple, direct, and earnest, of that life for which we believe every human being was born. Larger spaces are formed in their minds as they hear some story of the patriarchs or kings, and they delight to hear of that city whose common streets are precious as fine gold, whose gates are always open, where nothing may enter that defiles or that makes unclean, where songs of irrepressible joy burst forth from those who have gained an entrance, where the Light and Centre of all is One who gave Himself for them. Those who for some time have known one little company to whom I specially refer have observed how much brighter

and more human their faces have become. Amidst the disorders of a large court, they live quiet and peaceable lives, "true to the kindred ties of heaven and home."

It may be objected that all this personal work is too minute and laborious to become general, and that those occupied in it will die or fall out of health, and then their work will fail. In the future I trust that dwellings for large numbers of people will be so constructed as to remove some of the special occasions of evil common in tenement houses, and that they will be kept at such an average standard of decency as not to require all this setting in order. When a court has once become a home of lawlessness, nothing short of the efforts I have spoken of will reclaim it. Nothing else remains but to pull it down and scatter the inhabitants, who cannot even then be received into improved dwellings. It seems but too certain that some will always be falling out of the ranks, unable to regain their place alone. Surely the time will never come when strong hands will not be ready for any effort required to help them to their place again.

ON THE
CREATION OF A BUILDING FUND.

IT has been my lot to read a good deal of what has been lately written on the subject of the Dwellings of the Poor; how much that is, you know probably as well as I. During the recent discussion most of the evils of the present state of things have been exhaustively dealt with, and the difficulties which bar the way of reform have been carefully pointed out. But the most striking part of the whole matter has been the extreme dearth of any comprehensive scheme for meeting the evils complained of. The principal suggestions lie in the direction of the enforcement of existing Acts which has been insisted on by Sir Charles Dilke, Sir Richard Cross, and others; and their

challenge has been answered by the formation of Sanitary Aid Committees, which will occupy your attention on another occasion. Other minor suggestions, chiefly in matters of detail connected with these Acts and their working, have been made, which it is no part of my province here to deal with; but the main cry has been for enlightened and philanthropic voluntary effort, and Miss Octavia Hill's work has been again and again cited as the true criterion. Miss Octavia Hill herself insists on the absolute necessity of volunteer work, and no one who knows the indifference of the poor to matters of sanitary importance will venture to dissent from her. It is quite impossible, however, to trust so great a matter entirely to volunteer work; and Miss Octavia Hill and her coadjutors, though they have their hands full, can hardly hope, and indeed do not expect, to achieve anything more than a result which, however grand it is in itself, represents but a drop in the ocean of what is required to be done, and to be done at once. In the work in question, a considerable discretion in the choice of visitors is required, and the candidate who aspires to success must go through a prolonged novitiate; moreover it is not probable that the candidates will be so many, or their qualifications so marked, as to allow of the expectation of any very great extension of this work in the immediate future. What should be the limits of the work of volunteers, and how far we may rely upon their exertions, I propose to point out presently.

I have said that the suggestions for reform are disappointing, and it remains, therefore, to me to suggest without apology such a scheme as will, from its comprehensive nature, afford an adequate remedy for admitted evils. All the very excellent work of the Sanitary Aid Committees, and kindred societies and workers, can at the best be looked upon as but a partial and temporary effort; and ultimately the question must be dealt with systematically and comprehensively, in some such manner as it is the object of this paper to formulate.

To the work before us there is a commercial and there is a philanthropic side. I propose to keep them apart; for though they have been successfully united by Miss Octavia Hill, I have a great suspicion of their harmonious blending on a large scale. Miss Cons, indeed, who is one of the leaders in the Octavia Hill work, entrusts all the financial management of her undertakings to the care of independent companies, and this is, I believe, the prudent course, except in exceptional cases.

I had proposed in the first instance, in my article which appeared in the 'Dublin Review' for April last, to place the management under the control of a large and important company, and my calculations were based upon this intention; but though I still believe it to be possible to form such a company, there are a variety of considerations which have led me to prefer another course. However carefully and economically conducted, a large company must be heavily burdened with office and other expenses. Moreover, a good dividend is a hard taskmaster, and it is extremely likely that, in order to procure a desirable balance-sheet, such a company would drift into the present position of the Artizans' Dwellings Companies, would provide good accommodation, that is to say, but at too high a price for the working class. I do not of course mean that the Artizans' Dwellings Companies have effected any other than a great and useful result, but as I understand the problem, it is not for artizans that we are to build, but for what Lord Salisbury speaks of as the larger labouring classes who earn less than 25 shillings a week.

I therefore for the moment abandon the company, and propose in its stead the creation of a large public trust. The trustees should be men with a reputation and a credit to command the unbounded confidence of the public. The public would, I believe, contribute handsomely to such a fund. We should ask, of course, for donations in the first instance, and such an appeal would I am convinced be so answered that a second appeal would not be necessary. Having established the fund, and obtained a sufficient

nucleus, the trustees would be independent of gifts, and would be able to borrow whatever money they might require.

To substantiate this last statement I must refer to the calculations which I made, in order to ascertain the feasibility of forming a public company. I had very great difficulty in arriving at any reliable data, because no attempt has been made on a large scale to provide the class of houses of which I am thinking, houses, that is to say, of about five stories, designed to be let in one and two roomed tenements.

Now, first, as to the cost. I take Mr. Shaw Lefevre's figures as a basis for the cost of the land. He states that the loss of 1,250,000*l.*, incurred by the Metropolitan Board of Works in purchasing sites for artizans' dwellings, would have been reduced to 400,000*l.* by the operation of the Act of 1882. In other words, instead of 17 shillings a foot, that land would have cost 8 shillings. Land, therefore, purchased by arbitration without the compensation given under the Lands Clauses Act, and subject to deduction for want of repair (which is what is practically meant by the operation of the Act of 1882), would cost 17,424*l.* an acre. Assuming that the land is dealt with in the same manner as by the Artizans' Dwellings Company, that is to say, the whole cleared of existing tenements, and about half an acre covered with buildings to half an acre left for roads, open spaces, and areas, I calculate that the cost of dealing with 42 acres of land would be 2,411,808*l.*, inclusive of the cost of land, buildings, and all expenses. I am quite certain that I have put the cost of buildings much too high, but I am not so sure that the cost of land would be so low as Mr. Shaw Lefevre would lead us to believe. I am content, therefore, to let this estimate stand.

I made the calculations given in the 'Dublin Review' article for 42 acres, because that is the area which has already been dealt with by the Artizans' Dwellings Companies, and upon which the Metropolitan Board of Works

has lost 1,250,000*l.* Might we not reasonably expect that the Board, having spent this sum on the artizans, would be willing to lend a similar amount at a reasonable rate of interest (say 3 per cent.), and on good security, for the benefit of the labouring classes? In the event of no assistance being forthcoming from the Board, there is still the possibility of our borrowing from the Treasury at 3½ (or possibly we might even manage it at 3) per cent.

Secondly, as to income. I consider that the normal rent should be 2*s.* 6*d.* a room, and 4*s.* for two rooms. The rooms should be built on lobbies, so that they might conveniently be let either singly or in twos. I do not think we can expect to provide a man, his wife and small children, with more than one large room; as the children grow to a wage-earning age, another room might be within the capacity of the family exchequer. For the class of people I propose to deal with, more than two rooms would be superfluous luxury, and any scheme which expected to accomplish more than this would, I am sure, be doomed to failure. Such rents would be an immense boon to the working classes, who now pay 3*s.* 6*d.* to 5*s.* for a single small room; nor do I think any of those classes would find such rents exorbitant or beyond their reach. On this basis I calculate that on 21 inhabited acres the rents would produce 148,512*l.* per annum, out of which I should make a liberal allowance, say 59,404*l.*, or two-fifths of the whole income, for repairs, losses, and expenses, leaving an available balance of 89,108*l.* If we can borrow 1,250,000*l.* from the Board of Works or from the State, at 3 per cent., we should have to pay 37,500*l.* for interest on that amount; or if we had to give 3½ per cent., we should pay 43,750*l.*, leaving in the former case a balance sufficient to pay 4 per cent. on the whole of the remaining outlay, in the latter on very nearly the whole. If we cannot borrow from the country, we should have still enough income to pay 4 per cent. on 2,200,000*l.*, leaving only a comparatively small balance of outlay to be made from the trust fund. I do not anticipate any difficulty in getting as much money

as we may want at 4 per cent. from banks, building societies, or private investors, though we should not, of course, be able to borrow from them up to the full value of the land and buildings.

By such a scheme I estimate that 47,140 persons would be accommodated, or about double the number provided for by the Artizans' Dwellings Companies. The clearances would be effected and the buildings erected gradually, and it would be the aim of the trustees to provide evicted tenants with immediate accommodation. All the houses would undoubtedly have sooner or later to be rebuilt, the sooner the better. It is, in my opinion, a false economy to try and patch up most of the old dwellings, and I believe I shall be borne out by those who have attempted to do so. I have calculated upon the assumption that forty-two acres are dealt with, but I do not for an instant suggest that, when that is accomplished, the work of the trust would be at an end. I do not know how many acres require to be dealt with, but I do know that the area is a good deal more than forty-two acres. I do not think that any census has been made of the persons who require re-housing, but I know there are more than 50,000. I suppose there are more than 500,000. At all events, when we have satisfactorily dealt with our forty-two acres, we shall still have a fair field before us.

I should be far from wishing to see the Trust swamp private enterprise in the same direction, and I have no doubt that some of the funds might be profitably employed in assisting private individuals or small companies who are bonâ fide engaged in this work. Many excellent efforts in this direction have been thwarted by want of funds, and the trustees might profitably assist such by loans at a moderate interest.

One word as to the other side of the question—the philanthropic. It has been said that the "Bitter Cry" is a misnomer, because no complaint is heard from those who live in these wretched tenements, and it will certainly be granted that they feel very little the evils which we see.

I do therefore most firmly believe in the desirability of getting the trust property managed by trained collectors, who will stand towards the tenants in the position of Miss Octavia Hill, and educate them in decent and healthy living. I should allow ample space in the basements for recreation and club rooms, and the open spaces could be utilized for playgrounds and gardens. I firmly believe in the system of lady rent-collectors, for though the trust would not gain financially, as it would pay the volunteers the ordinary percentage for collection, yet it would reap all those moral advantages which undoubtedly result from this work.

I do not propose to enter into further detail on this side of the question, because you all probably know the leading features of Miss Hill's method; if not, I can only refer you to her 'Homes of the London Poor,' and congratulate you on a pleasure in prospect.

In conclusion, it is but a natural consequence of the subject allotted to me, that my Paper should be statistical and dry; I have endeavoured to say as many practical words in my allotted time as possible; I have therefore refrained from any description of the present evils which I wish to remedy, or any eulogy of the elysium I hope to prepare; I assume your knowledge of the former, and I leave the latter to the freest exercise of your imagination.

DISCUSSION.

The ARCHBISHOP OF CANTERBURY, in opening the discussion, said they must all thank God that at length public attention was being called to this great question, to which earnest labourers had been trying to call attention for forty years, and he believed there were very few new facts to be made known on the subject. But it was a matter of great importance when at last the whole of the people of London

and England were aroused to look at the facts as they really were, and he had all confidence in his fellow-countrymen, that he believed, when their attention was fairly aroused, and they were fully acquainted with things as they were, some practical result would follow. He was sure he must present to the readers of the three papers that afternoon the best thanks of the meeting for having given them such interesting and well-studied papers. Upon the first subject of the afternoon he would remark that, if they looked back long ages ago, they would find that the ancient idea of a Greek or Roman city was that it should be compactly built, with very little knowledge indeed of sanitation, but with this great proviso, that all round about the walls, which in those days were necessary, there should be a large area of common land. He did not know whether things had gone too far in England to hope ever to see such belts of common land round our villages and towns; perhaps they had, but the hearts of those to whom the land belonged must be moved to let the people into the possession of things quite as good. If one looked at Vienna, one saw a great stretch of open ground with trees surrounding the old city, which had not been built upon, and beyond that the modern city had been compelled to establish itself. Something like that on a gigantic scale—and London was not afraid of doing anything on a gigantic scale—must be done. Supposing the old centre of London were surrounded, with lines running out in every direction, and here and there around it the towns, which would henceforth be built with some idea of sanitation, and be surrounded with their own lands. It had been suggested what a great thing it would be to enable the working classes to own their own houses. Of course every one must accept the idea with thankfulness, and admiration, though as practical people they knew very well that no time would come when every workman could own his own house any more than every one of those present could do so, but at any rate there might be, as in other classes, a large number of people having the happiness of owning their houses, and transmitting them to their chil-

dren, and that even those who did not own their own house should have the opportunity of being face to face with those who did own them. They were all agreed that it was not good for people and their families to be in the hands of middlemen, and they should all hope and work for the day when a large number of these artizans would own their own buildings, and when those who did not would be in the hands of reasonable, understanding and humane landlords.

There was another question which seemed to his mind to be very fairly in the way of settlement, springing out of the creation of these model villages if they were realised, and that was the question of public-houses. They had heard that in these places there were no public-houses, and the inhabitants did not want them; but now, if the working men in their model villages showed practically that they could do without public-houses, they would have advanced a long way towards getting rid of the awful thoughts, the awful feelings, the awful sights that interrupted all one's meditations or conversation, in passing along the public streets at the present time, where they saw those palaces without end absorbing and regurgitating their unhappy victims. He did not wish to be chimerical, and to see the whole of the tracts now inhabited by the poor, covered with model dwellings; but, on the other hand, he quite agreed that there must be by this time a large mass of houses with which nothing could be done but to pull them down, and substitute in their places model dwellings in great blocks. On the other hand, it must not be supposed that there was any one particular receipt which could be used for the solution of the whole of these complicated problems. On the whole he did not think an artizan very much liked dwelling in a public block. They were, no doubt, much better than pig-styes, but no one, whether artizan or not, liked to live in a model anything; he liked to live in his own house or his own cottage, and where houses and cottages could be rendered tenantable they should be made so. All the little peculiarities in a

house, even having a door in an awkward place, or a window laid on its side, or a crooked staircase, all these things got endeared to the inhabitants of those houses, and they would not exchange the peculiar house in which they had been brought up even for a much more comfortable one in other respects. They must remember that the arrangement of houses, in the way in which they were decorated, and the way in which the little bits of furniture were placed, showed character, and the English people above all liked to exhibit their character in everything around them. They must also remember that these people were human beings, and that whilst even birds and beasts liked to make their own nests and their own lairs, and arrange them according to their own fancies, and as the most polished specimens of the human race spent some of them a disproportionate part of their time in laying out and beautifying their dwellings, so, as far as possible, should every working man have some opportunity of influencing the arrangement and laying out of his own house.

While he would say all honour was due to those who, in the first instance, broke through the difficulties, and went, like Miss Octavia Hill and the lady who read the paper that afternoon, or their friends, across the bar, which some brave men there would not have liked to cross in the first instance, he was sure they would all agree in saying that they had got a good deal of human experience from their labour. There was a great deal in the communications which passed between the collector and payers of rent which put them on the platform on which human beings ought to stand one towards another. Only a few days ago a lady told him of her new experience in this work of collecting. She had been week after week to a good woman for her rent, and always found her out at the particular moment. In the first place, when she went, the woman said that now they began a new system, and had a new rent-book, they must start fair, so she could not pay any arrears ; but having started fair, this lady could not for two or three successive weeks find the woman at home.

At last, the fourth week, she went a little before the time, and saw her friend escaping down the entry; however, she went after her, and then the good woman immediately produced her rent, arrears and all, carefully wrapped up and directed in the neatest manner. She was going to make off with it if she could, but if she could not she was quite prepared to pay it. This brought him to a thought which arose out of all the papers, viz., how very kind was the view taken of the masses by those who really knew them. And was it to be supposed that those who really knew them were those who were most taken in about them? Whilst many regarded the masses with fear, and gazed upon them with terror, and had all sorts of ideas as to their religious opinions, their political opinions, and what they were going to do in the future, the very persons who went in and out amongst them were those who took the very kindest view of them, said how human they were, and how delightful it was to know them well. Finally, he would say, that he fully agreed with what Miss Lidgett had said with regard to talking religion to these people. No doubt there were two ways of talking religion; but what struck him as rather an odd thing was that people always thought their neighbours were going to talk to them in the wrong way; that whilst they themselves would talk to them in the most kind and thoroughly Christian and apostolic manner, just as Christ did to his disciples, they always thought their neighbours were going to talk to them about theological subtleties. He never knew any one who really visited amongst these people who carried with them anything it was too hard to understand, except in the sense that all religion was too hard to understand, because whilst it came close home, it dealt with those mysteries which they would have to penetrate, and not penetrate to all eternity. He would say, therefore, let all men know that these people are bone of our bone, flesh of our flesh, heart of our heart, and spirit of our spirit; and let us learn to know them, to live with them, to love them; and then, when forty years of such work as the Mansion House Council have inaugurated

had passed over their heads, England would be a far happier land than it had ever been in the past or was in the present. (Applause.)

The Rev. R. C. BILLING said he knew something of the people of the East End, having lived there for six years, and he could say that those who knew them best feared them the least, and were prepared to trust them to the uttermost. He ought to know something of this question, being rector of a large and populous parish in the East End, being *ex officio* member of the Vestry, and member of a Board of Guardians, and of the Local Board of Works. He was glad to say that he found himself in very good company, for there were some at least who did not altogether disapprove of the Government Reform Bill for the Municipality of London. It was said that the Bill was objected to by all members of Vestries, Boards of Works and Local Bodies, but he begged to say there were some exceptions ; and although they did not believe the Bill to be altogether perfect, they believed it afforded the foundation for the settlement of a question which had very much to do with the subject under discussion.

Mr. LIGGINS : Nothing whatever.

The Rev. R. C. BILLING said he was sorry that gentlemen did not think it had, but he would presently show that it had, for if the people of London were able efficiently to govern themselves, there were many vexatious questions with regard to the housing of the poor which would be presently settled. One grievance under which they suffered at present was this, that while a great number of uninhabitable houses were pulled down the new houses were not built in their places. He hoped the people would not be misled by statistics ; sometimes they were told that 10,000 people had been unhoused, and then that accommodation had been provided for 8000, leading to the supposition that only 2000 had been actually dispossessed, but if they would look at the 8000 new tenants, it would be found that in all probability they belonged to an altogether different class to those who were dispossessed. They

wanted dwellings not merely for the artizans, but for the poorer classes, those earning not only below 25*s.*, but below 18*s.* a-week, and they must be cheaper rents than Mr. Harrod suggested, something cheaper than 2*s.* 6*d.* for one room, or 4*s.* for two. Something must be done at present. It would be some time before the great Blue Book was issued, and before there was any alteration in the law, but there were one or two things which must be done at once. In the first place he should much like to see a legal definition of what overcrowding was. It was now left to the medical officer of each district to decide for himself, and those whom he advised, but there ought to be a certain number of cubic feet of air allotted to every human being in the Metropolis, and it should be the duty of the local authorities to see that it was provided. Next, all houses let out in separate tenements should be under inspection, as all common lodging-houses were. The people in his parish who lived in the lodging-houses were, in many respects, better off than those living in flats, in single rooms, or cellars of their own. These houses must be put under inspection if the local authorities would put the Act of Parliament in operation. But who was to make them do so? That was an answer to what his friend said just now. They wanted the sanitary inspector made independent of the local Vestries and the Boards of Works. Those who knew something of the condition of the poor, and something of how business was transacted, said that local sanitary inspectors should be placed in the same position in which those gentlemen were who were employed under the Board of Guardians. As a member of such a Board, he could say that it was useless to remove any official serving under the Poor Law without the consent of the Local Government Board, and so it ought to be impossible to remove any sanitary officer without the consent of the same Board. They ought to be encouraged to do their duty fearlessly, and for the benefit of those in whose interest their office was created. If these pressing reforms were introduced, a

great deal would be done to remove the present evil state of things. He was very hopeful about it, because he believed the people themselves were now thoroughly interested in the matter. It had been hinted in one of the papers that the people were rather satisfied with the condition in which they were; and he knew there were some who were quite ready to remain in the present condition, but they formed a very small minority of the working class; as a rule, they were thoroughly dissatisfied with their condition, and when ministers of religion went about proclaiming the Gospel they were met with this kind of remark—"Is this religion? Is this Christianity? We are compelled to pig down here in these horrid holes and cellars, and here are these large open spaces from which all dwellings have been cleared away; why is it that you Christian and religious people do not give us houses in which we could dwell as human beings, to say nothing about Christians?" If people should become dangerous it would only be because those who ought to help them to better habitations, amongst other things, were careless of their condition. If they only did their duty by the people, the people would always be on the side of law and order. It was thought by some that there was not so much of the evil of overcrowding as was supposed, but he could tell them that he had traced the history of several families, and he found that sometime ago, before they were thrown into one room on account of their habitations having been cleared away, the children were brought up virtuously and honestly, and were doing well in life, whereas the younger children who had been brought up under the contaminating influence of the one room, had to a very great extent gone wrong. There was a great and dreadful evil arising from this overcrowding.

Dr. FINCH then proposed a vote of thanks to His Grace the Archbishop for his kindness in coming to take the chair.

The ARCHBISHOP thanked the Meeting for the kind manner in which the few words he had said had been

received, and apologised for having to leave on account of the pressure of other engagements.

The Rev. J. C. COXHEAD then took the Chair for the remainder of the Meeting.

The Rev. MARK WILKS (Chairman of the Committee of the London School Board) said he would only refer to one point raised in Miss Lidgett's Paper. As a member of the London School Board he was brought into immediate acquaintance with very large masses of the people, and his own belief was, that out of the 350,000 children whose names were on the roll of the Board School, not more than one-third, or their parents either, were adverse to education. The difficulties to be dealt with must not be exaggerated ; they must not merely say that these people were human beings like themselves ; the point was, they ought never to have forgotten it. These people were amenable to all proper influences, and he was quite persuaded that their intelligence, their conscience, and their reason, could be set at rest on the subject of education. He quite agreed with Miss Lidgett that those who were drunken, idle, and vicious, must be treated with the justice they deserved, but their first consideration must be for the earnest, sincere, and well-intentioned amongst the poor. If necessary, the others must be dealt with severely, but the great point was to do justice to all.

The Rev. G. S. REANEY said, they were now pretty well getting to know what they wanted to do ; they wanted to get rid of the influence of the public-house, and its temptations to people to indulge in intoxicating drink, but that could not be done except by the action of Government. Then they wanted to get the present Sanitary law put into more vigorous operation, as Mr. Billing had said. He was not a member of a Vestry or Local Board, and he was not sorry for it, because if you sat in a room a long time the atmosphere got polluted and you did not know it, but when you came in from the fresh air the oppressive con-

dition of things within was manifest, and his own impression was that the good people on these Boards were not quite so well aware of the real condition of things as those were who had never been so honoured. What was mainly wanted was dwellings, not for artizans, but for widows, unmarried women, and for young girls trying to earn their living virtuously, and who could not earn much more than 12*s.*, and some not more than 7*s.* a week. If it was a single room tenement it should be under inspection, for he could quite confirm what Mr. Billings had said with regard to Ratcliffe ; if you went into a tenement-house you found it as bad as could be, and you were astonished to find that the common lodging-house was comfortable and clean in comparison. He did not see that anything had been said to-day to show that homes for these poor people could be provided without the help of Government. Those who were working in this matter would soon divide into two sections ; those who went in for the Government to do more than it had ever done in the past, and those who went in for benevolence and private enterprise. Reference was made to the gift to be made to Ireland, and he sometimes wished they were in Ireland. If they could only get London into Ireland they would be attended to. It had not taken five millions of Irishmen to get attention to their grievances ; a few score Members of Parliament—apart from all outrages—had forced the Irish question on the attention of the Government, and when they got Members of Parliament for London in the number they ought to have, there would be some hope of something substantial being done. Was any one prepared to stand up and say that private enterprise, which had hitherto resulted in making the slums what they were, was going to get a conscience, was going to get tender-hearted, and to receive 1¼ per cent. very graciously, and say that virtue was its own reward? He did not believe it, and if they trusted to private enterprise, all he had to say was that in twenty years things would be worse than they were now. Was benevolence going to do it? He had made some examination into the

localities about which they had heard so much lately, and he found that the darkest spots were under the shadow of great churches and chapels. Did that mean that benevolence and spiritual influence had not been at work? It might seem to be an Irishism, but he should have a great deal more hope for these places if there were no churches and chapels there, because then people would say, Put a chapel or a church, bring religious influence to bear on these people, and you would do some good. They had been living within the sound of the prayers and the psalms that these good people had been singing, and the darkest plague-spots in London to-day were in some of the best-worked parishes, and within the shadow of some of the largest chapels he knew of. They were told there was a failure because of the overbuilding of villadom and respectable artizans' dwellings round London, but if any one wanted to make 12 per cent. let them build somewhere in the slums, and build a slum, and they would almost certainly do it. He calculated that for every room in the house in which he lived, he did not pay anything like the rent which the people did in London at Ratcliffe, nor did the landlord get anything like the percentage which those did to whom those wretched slums belonged. How did they expect private enterprise to deal with such facts, they would have to go to Government to get the work done.

On that question no doubt there would be a division, and they would be told they were Socialists. There was a very remarkable article to-day in a paper which he always read, though he did not always agree with it, the *Standard*, but when he was a boy he was told *audi alterem partem*, and he should recommend all Radicals to read Tory papers; it was a Socialist article as far as he understood it, showing that there could be nothing effectually done on this question, either about public-houses, or about the enforcement of the law as it was, or about the building of the houses for the poorest of the people, unless Government stepped in. He did not feel so much interested about the artizans and trade unionists, because they could

take care of themselves. He looked with admiration to see the way in which they fought their battles with the capitalist, and generally beat him; but he was anxious about the people who had no trade unions—for whom nobody fought. Government cared for the education of these people, but Mr. Wilks understood perfectly well that they would never get the children into the schools as they ought to be if they went on enforcing the fees. He knew a district where the school fees were 40 per cent. in arrear, and that pointed in the direction of free education. People said you must educate the people by the Government, but you may let them live in the slums so far as the Government is concerned; you must enforce the code, but you must let the children live in places that sent them to school pale, tired and wearied, ready to take disease, and not ready for work, and yet Government was to do nothing If he understood anything of the duty of Government in educating the people and in draining the streets, why should it not go a little further and see that the houses were fit to be lived in. They said they did so, but what did they do in Whitechapel under the Act of Parliament? They turned out 7000 or 8000 persons, and left the places vacant for five years, and the people were obliged to crowd into Ratcliff. They did not want to be left to the mere local authorities, and that was why he liked the new bill, because they would be able to get money, not merely for sanitation in the streets, or for an education rate, but for a building rate, to build for these people houses for which they should pay an honest rent, the cost being paid back in forty or fifty years, not perhaps receiving much interest, save in the great return of larger healthfulness of body and mind of the people who lived in the houses. Those who took the other side, and who relied on benevolence and private enterprise would say he was wrong, and the battle would have to be fought out, but they would fight it out as friends and not as foes. They were coming to a point where the two roads would branch off. For his part he said distinctly that there had been nothing yet proposed

which would deal with London in the large sense demanded to benefit the people without Government aid, and the next step would be to get Government to do it.

The Rev. HENRY SOLLY said it was very pleasant to agree with everybody, but it was sometimes useful to disagree. He agreed with a good deal which had been said that afternoon, but he was bound to say he disagreed with some portions of what almost every speaker had said. He would, however, confine his remarks principally to the interesting and useful paper by his old friend Mr. Hole, who had worked in this cause many years ago. He had been praising up the Artizans' and Labourers' Dwellings Company to-day, and very rightly, but he should like to ask him how it came to pass that the open space in the centre of Shaftesbury Park had been built upon, for he was told last week it had all been covered with buildings; probably because private enterprise looked at 5 per cent., and did not look at philanthropy and recreation. At the same time Mr. Hole dealt with a very important point, viz., that of giving workmen the power of taking season-tickets in the way the upper classes could do; on that point he went with him heartily, but he must differ from him in looking to the establishment of workmen's dwellings within such a distance of London as would enable the workmen to go backwards and forwards from their labour. He did not believe that salvation in this matter was to be got out of the plan. The workmen too long had to follow their work, and to follow capital, and it was now time that capital and work should follow them, and that they should be able to go a greater distance from London. He could not see why all the great industrial occupations, which employed the labouring masses of this city, should be carried on under such miserable conditions. Chairs were made just as well at High Wycombe as in the Old Street Road. Straw plaiting, and a great many other industries, were carried on at Luton, and other places at a distance from London, and he did not see why a number of the London industries should not be carried out of London a

distance of twenty or forty miles. He believed the true solution of the difficulties would be found in combining the cultivation of the land with these home occupations. 40,000 persons crowded into London every year from the agricultural districts, because the land was got out of cultivation. There were seven miles of farms to be let the other day in the neighbourhood of Cambridge, but if the farmers could not cultivate them and the landlords could not—and he knew landlords who had taken farms into their own hands, and made a loss by it—the artisans and labourers would cultivate it, and make a very fine profit out of it. This was shown in the Rev. W. C. Stubb's Book on 'Land and the Labourers,' in which he showed that in the neighbourhood of Gainsborough labourers could make a fine profit when farmers declared the land completely worn out. In that parish a farmer threw up a field for which he was only paying 11*s.* an acre, and now the labourers had got hold of it, and were paying 4*l.* an acre. His Grace the Archbishop referred them to Vienna, and other old towns, where there was a large belt of land surrounding the town kept sacred from enclosures. But he would remind them that they might go further back still, and find innumerable village communities surrounded by large belts of land, not merely for recreation and parks, but for cultivation—land held by the whole village community, arable and pasture, and that was what they ought to come back to, village communities or settlements, who should have their own land held in common, whilst each man had his own house and garden to himself. If this were accomplished, it would be a true solution of the problem which was so pressing at the present day with regard to the tenure of land. They talked about building in London, where land was being sold at 17*s.* a foot; but where was the necessity of building on it at all? why should they confine their working-classes to these vast cities and horrible slums? if they let them loose on the land a great deal of the miseries they were now troubled with would drop off, and the burden would be gone for ever. Village settlements, such as he referred to, would

enable them to live in health, morally, physically, intellectually, and religiously, and they would be able to work out their own happiness and welfare. Twenty-two years ago the working-man's club movement was started, and those clubs had grown and prospered wonderfully. Those who inaugurated the movement provided certain vessels as it were into which all good things might be poured, and now they had clubs covering the country with useful, moral and intellectual agencies. The same thing would happen with village settlements if they were only permitted to establish them; if, in the same way, they provided vessels into which they might pour all that was best and brightest, the movement would soon spread. God and all good men would help them, and they would bring old England back to a far happier condition than it had ever been in yet.

(The Chairman here announced that as there were several other speakers, and the hour was getting late, only five minutes could be allowed to each).

Mr. ALBERT BARKER hoped the result of the Conference would be not only to bring the facts more prominently forward, but to suggest some practical remedy, not only in the way of a comprehensive scheme, but also as regarded individual enterprise, and the personal influence which Miss Lidgett had so well brought out in her admirable paper. He had seen very much good result from personal influence brought to bear by those whom Providence had placed in happier circles, and he hoped one result of the discussion would be to bring forward a great number of those who with the best intentions in the world had not as yet done anything practically to help forward the work. A Committee had just been formed in that district in connection with the Mansion House Sanitary Committee, and he would ask all who could, either ladies or gentlemen, to come forward, and assist in the work by their own personal efforts, which would do a hundred times more than any amount of money.

Mr. GEO. BROOK (Leadenhall Market) said he came there because he heard something was to be said with

reference to the railways. The rich people had taken away the houses of the poor in London, and there ought to be some means whereby those houses could be rebuilt outside the city. Railways had taken away the houses of thousands and thousands of people all round London; the mischief was not confined to the East-end, and they ought to give facilities for travelling. Reference had been made to the loan of 20 millions which Ireland was to receive, and how had they got it? By making a row; and that was the only way in which it could be done here. He had been delighted to hear the invitation given to the working-classes to come there, and he hoped they would come; if they did they would speak out plainly what they wanted. He was also delighted to hear that the Corporation was to be enlarged, and carried all round London; that was what ought to have been done in 1855, when Manchester, Liverpool, and all the great towns had the Municipal Reform Bill. The Eastern Counties Railway only charged 2*d.* for working-men's trains, but the London and Brighton Company charged 4*d.*, and what was the consequence? There were 20,000 houses ready to be let to-morrow all round the South of London, but which remained empty because there were not facilities for travelling. Many of his men lived in the suburbs, where they had a little cottage, and bit of garden, coming up by the Eastern Counties Railway, and they were all the better for living in the fresh air.

Dr. GODFREY said he was deputed by working-men themselves to attend, and he thought it was a pity they had not been heard before. He represented a Society of working-men who had tried, through Mr. Gladstone and through Sir Charles Dilke, to be heard on a plan which they had themselves formulated, and which was the only feasible plan for dealing with the difficulty. He could not explain it in five minutes, but would give some little idea of it. The Association numbered 2,000 members, and could give security for any money advanced to them; they asked for money to be advanced, on the principle stated in

one of the papers, for the purchase of houses at 150*l.* each freehold, and if the Government lent them the money at 3 per cent., it would only amount to a yearly rent to the labouring man of 4*l.* 10*s.*, or 1*s.* 8*d.* a week. The members, however, were willing to pay the usual rent, which would be 5*s.* 6*d.*; the Society would make over the freehold, but hold the deeds, and pass to his credit the whole amount over the 1*s.* 8*d.* per week, which at the end of the year would amount to 9*l.* 13*s.*, and this would be continued until the whole of the amount was paid off. The plan had already been tried on a small scale, borrowing money from the London and Joint Stock Bank at 3¼, 4, and 4½ per cent., but they could not work satisfactorily unless they could obtain the money at 3 per cent. If the Government would now lend this Society, which was formed, out of the Savings Bank money, for which they only paid 2½ per cent., at the rate of 3 per cent., the question was solved at once, for there were hundreds of poor people who would take advantage of it.

Mr. THOS. MOSS said the end and aim of such conferences was to hear papers read and plans brought forward, and then to criticise and discuss those papers, but they had rather wandered from that method of procedure. It had been said that the houses built around London were not the class required; but speculators had introduced what was termed the double tenant, where a house was built to let for 8*s.* or 10*s.* a week, divided into two households, each series of rooms being fitted with all the necessary appliances. If they could, as had been said, induce the Railway Companies to introduce cheap workmen's trains, a great part of the difficulties would be solved; and if they could not be induced, they ought to be compelled. There was a precedent in their being obliged to run Parliamentary trains; and if they would not run cheap trains for the working classes, the Government should take the Railways, as it had now the Post-office and Telegraphs. There was a great difficulty in dealing with this very low class of property. Supposing they had

a row of twenty houses, as he knew of one near the Old Kent Road, of the very worst character; they were anxious to get rid of them, but how could they do so? The Magistrate could not assist, nor the Poor Law Guardians, and so they remained a scourging nuisance to the whole neighbourhood. He would suggest that some more stringent law should be enacted, by which holders of property could remove objectionable tenants, to the ultimate good of those who remained.

Mr. HENRY LIGGINS said the paper read by Miss Lidgett was to his mind almost perfect, and contained most valuable suggestions. One gentleman said that the public and philanthropists were just waking up to the necessity for some organisation to improve the dwellings of the working classes, but he begged to say that some forty years ago he inspected the back slums of Whitechapel, in company with a well-known author, known as Alfred Crowquill, so that there was nothing very new in this question. He begged to refer the meeting to four valuable papers which appeared in the December number of the *Nineteenth Century*. Two of the writers said that the law was quite powerful enough to deal effectually with this question; and as a vestryman of the parish of Kensington, he begged to say that the slurs cast upon the Vestries were not deserved. The great difficulty met with was this: the Sanitary Inspector would perhaps go into the worst slums of Kensington, and be horrified at finding dwellings not fit for pigs, and determine to turn the inhabitants out; but as he walked away he had to reflect where were they to go to, and when he came to take the advice of the Committee under whom he acted, the only conclusion that they could come to was to wait until other dwellings were built. But in Kensington they could not get land on which to build. That was the first great difficulty, and the next was the money. Again, they had it on the authority of an intelligent working man, who spoke at a similar conference at the Society of Arts, that as a rule the working classes did not like the model

lodging house, they did not like the supervision, they did not like to be interfered with in their ordinary modes of life, or to be told that they must be in at eleven o'clock at night, and that they must not get up at three in the morning. It was all very well to talk of cottage homes in the country, and to say that the private persons who owned the Railways must be made to run cheap trains, but working men who got less than 1*l.* a week could not afford even to pay 2*d.* a day for railway fare; and when he had got his cottage, the great difficulty was that he had not got a cheap market where he could buy the necessaries of life. He found that was a strong objection which artisans had to living in model houses in the country. It was all nonsense to say that working men could cultivate the land; the sweat of his brow might grow potatoes enough for him and his children, but that was a disgraceful and discreditable attempt to produce communism, which he was ashamed to hear come from an educated man on the platform. There had been too much communistic feeling. They must all work to be successful; it was not to be done by taking the property of the rich. He knew a nobleman now who would let honest men have farms for nothing, if they would only pay the taxes; but they remained unoccupied. There was also a great change in the shipping trade in London, which operated injuriously on the working man, many of the larger steamers being now discharged by steam cranes, and any morning from 600 to 1000 men could be seen at the London docks anxious for employment, but a great proportion of them were unable to get it.

Mr. FENWICK said all the evidence put before them showed that London as it was, lesser London, could never house the people necessary for the work required in it. If the whole of the open spaces were built into flats it would only accommodate about as many as would come to London during the year. They wanted every railway to give what the Eastern Counties did, 2*d.* trains for working-men, so that they could come in and out daily. He had built

cottages, containing four good rooms with a scullery, let at 5*s.* a week, which paid 7½ per cent. gross, allowing for rates and taxes and repairs, a clear 5 per cent. He was now building some on a somewhat smaller scale, which could be let at 4*s.* a week, which would give equally good returns; and if the tenants would undertake to pay the rates, taxes, and repairs, and pay the same rent, they might buy the house in twenty years. He was aiming rather at the labouring classes than the artisan, and when it was said that the working-man was as a rule a wanderer, it was not true as a rule with this class; they did occasionally wander from one parish to another, but seldom went farther, but even if they did, arrangements could be made whereby their interests in the houses could be transferred to a successor.

The CHAIRMAN, in concluding the proceedings, said, though there had been a considerable difference of opinion on this subject, there had been a remarkable unanimity, and it was encouraging to all those who took an interest in the welfare of the working-classes, to know that something was about to be done on their behalf. They were shortly to hear the result of the inquiries of the Royal Commission on this subject, and it would be premature to express any definite views as to the measures to be adopted until that Commission had reported. Of this they might be certain, however, that when the Report of that Commission was published, some kind of legislation must follow, and then would be the time for Members of Parliament to bring forward the various schemes which had been alluded to, so that they might be ventilated, and if practicable, carried out; such a meeting, characterised as it had been by so much unanimity and enthusiasm, was likely to have considerable influence in stirring up and directing public opinion on this question.

(A vote of thanks to the CHAIRMAN concluded the proceedings.)

Conference on Friday, June 6, 1884.

His Eminence Cardinal Manning took the Chair at 2 o'clock.

1. "*Some Difficulties of Sanitary Administration in the Metropolis.*" By Shirley Murphy, M.R.C.S.
2. "*Some Defects in Sanitary Administration in the Metropolis.*" By B. A. Whitelegge, M.D.
3. "'*Suggestions*' *to the Royal Commissioners on the Dwellings of the Poor.*" By C. M. Sawell, Esq.

The Chairman, in commencing the proceedings, said there was evidence enough, and more than enough, of the deplorable and shameful condition of the vast proportion of the population of this Imperial city. That condition was deplorable, because he believed many of the people were at that moment herded together in dwellings not fit for human habitation; and it was shameful, because in that vastest city of the world, in that Imperial city of the greatest Empire of the world, having a population of 4,000,000—a city which was a commonwealth in itself—the riches of which he hardly knew how to put into figures, for he was told that every year its growth was to be measured by millions, and that the rental of London was something fabulous—out of the midst of all this wealth there should be dwellings not fit for human habitation, was a shame and a blot on the British Empire. He would call upon the gentlemen to read their papers first and take the discussion on the whole at the end.

SOME DIFFICULTIES OF SANITARY ADMINISTRATION IN THE METROPOLIS.

I HAVE much pleasure in complying with the request of the Mansion House Council for the Dwellings of the Poor that I should say a few words on sanitary administration in the metropolis, a subject with which the health of the community is most seriously concerned, and particularly of that portion of the community which is the especial care of the Association at whose instigation this Conference is held.

I would wish to occupy the brief space of time which is allotted to the reader of each Paper by asking the attention of this meeting to a few considerations which naturally suggest themselves at a time when the government of London is likely to come more prominently both before Parliament and before the public ; and I would desire to take this opportunity of pleading for a more thorough recognition of the fact that the prosperity of this vast city is intimately bound up with the health of its inhabitants.

It may indeed seem almost unnecessary to plead for due regard being had for health considerations at the present time. The very fact that we are meeting in an International Health Exhibition itself bears witness to the interest which is felt in all matters relating to health, and it might be assumed that in the government of a city of four million inhabitants at the close of the nineteenth century, such an important consideration would not be lost sight of.

It is therefore the more necessary to point out how very small a share thought for health really has in London government at the present time, and how much need there is for the London of the future to be more wisely controlled than the London of the past.

Wherever we look we find this to be the case.

Health is everywhere deemed of less importance than mere pocket interests, although even if we held no higher view of health and life than their pecuniary value, we should

be acting wisely in making some sacrifices for their preservation.

It would indeed be impossible to estimate more than very roughly the loss of money which a community suffers from the loss of wage-earning power during sickness, but it needs no argument to show that the amount every year is simply enormous, or that the loss sustained by sacrifice of life in the wage-earning period by those diseases which are preventible is immense.

An old record recently discovered in the University of Cambridge by Dr. Paget, and which is before me as I write, enables me to show the rates at which people died during the latter part of the last century in certain large towns, and I will, for the purpose of showing the saving which has already been effected, give at the same time the death rates of the same towns about a hundred years later.

	Death rate per 1000 in 1774.	Death rate per 1000 in 1883.
London	48·1	20·4
Edinburgh	48·0	19·2
Dublin	45·4	29·2
Leeds	46·2	23·3
Northampton	37·8	17·5
Shrewsbury	37·8	19·8
Liverpool	36·3	26·7
Manchester	35·7	27·6

All my hearers are probably not aware that in some parts of this large city people are still dying nearly at the rate at which people used to die in those towns a hundred years ago. There are indeed two Londons, the London of the well-to-do, in which money is able to procure conditions which tend to reduce sickness and death, and the London of the poor where no money can be spared for conditions necessary for a healthy existence, and where therefore well-regulated laws are especially required to enforce those conditions which the absence of wealth prevents the people from purchasing.

Great, therefore, as has been the saving already effected, it has not been uniform throughout all parts of London,

but Londoners may learn from these figures that the conditions under which they live must determine whether their lives shall be long or short, whether attended by health or sickness.

Recognising then this fact, is it too much to ask that thought for health shall be one of the chief considerations in the government of the metropolis?

Let me first show how really little thought for health there is at the present time in London government.

I will take as my first instance the question of overcrowding, a subject which affects as intimately as any other the health of the community.

By the word overcrowding, I do not limit myself to overcrowding in individual houses, but I wish to refer to the overcrowding of houses upon a site.

What provision has been made to prevent this evil? I shall not be mistaken if I say that almost up to the present time the only thought which has controlled the arrangement of houses upon a site is thought for the convenience of traffic and not for the health requirements of the inhabitants.

Not until the year 1855 did London insist upon the preservation of any open space at the back or side of the houses which were covering the land, and even then what did this open space amount to?

For houses intended to be used as a dwelling, and having rooms which could not be lighted or ventilated from a street or alley, a space of one hundred square feet was required at the back or side; a mere space of ten feet by ten, whatever the size of the building either in height or in width.

It was not indeed until 1862 that the height of a building was held to have any relation to the need for ventilation, and even then this principle was applied only to buildings about to be erected in new streets of less than fifty feet in width.

In the year 1882 much advance was made; the amount of space in the rear of houses, it was thought, should have

some relation to their size, and for new houses built upon land not previously occupied in whole or in part before the passing of this Act, an open space equivalent to a strip of little more than ten feet, continued in proportion to the width of the house, was deemed necessary, and fortunately this open space was required to extend across the whole width of the house. But, alas! it must be noted this provision is limited to houses built upon land not previously occupied in whole or in part, before the year 1882.

Again, although the space thus required is by courtesy called "open," it may be covered by buildings to the height of the ceiling of the ground floor, and the houses surrounding it may be carried to any height, leaving the open space a mere well for which London can only be grateful in the absence of something better.

I would beg my hearers to consider what the future of London might be under these circumstances.

The London, which consists of houses built previous to 1855, covered with a dense mass of buildings occupying every inch of ground except the streets themselves and the few areas upon which no building may be erected; the houses carried to any height the owner may think best for his pocket; not a foot of open space at the back preserved.

The London, consisting of houses which were built between the years 1855 and 1862, requiring a mere hundred square feet of space for those houses possessing rooms which could not be lighted directly from the street or alley.

The London, consisting of houses built during the years 1862 to 1882, requiring in addition a limitation of the height of houses in those new streets which were made of a less width than fifty feet; and the London consisting of houses of the present time from 1882, requiring an increase in the amount of open space, and preventing back to back houses, but permitting that open space to be covered with buildings up to the ceiling of the ground floor story.

Another difficulty arises from the want of full recognition of the fact that the manner of construction of the

house affects the health of the inhabitants. No adequate provision is made for those who are unable to afford the means for occupying a whole house.

Thus, houses which are constructed to accommodate one family become occupied by several. Now the requirements of persons living under these two sets of circumstances differ very widely, and the house which the smaller number might perhaps inhabit without detriment is altogether unfit for occupation by a family in every one or two rooms. The size, ventilation, and arrangement of the rooms are altogether unsuited for the requirements either of health or decency ; the badly ventilated internal staircase gives but too much opportunity for disease to be communicated from one family to another.

Even when houses are specially provided for the poor, they cannot always claim to meet the requirements of health of the inmates. At the present time there are in existence, and are still being erected, so-called model lodging-houses, which a more enlightened public opinion will condemn.

It may well be asked what are the Sanitary Authorities doing to permit such a condition to be perpetuated?

London, alas! has no Sanitary Authority to deal with such questions. It is true she does possess sanitary authorities, but their duties are of a different character. It is only after the site is covered, after the house is built, and after the inhabitants are exposed to ill-health or have lost their lives, that London thinks it well to give the sanitary authorities power to act.

At the present time the Sanitary Authorities exist rather for the removal of nuisances than for the prevention of disease.

I would wish to emphasise this statement by referring to another subject altogether different from that of house construction, and which may be taken in support of my argument that the prevention of disease is now only incidentally the duty of the Sanitary Authorities.

We all know how infectious disease kills thousands of

persons every year in London, and how from time to time some great outbreak of this disease is traced to milk. Where does the duty of the Metropolitan Sanitary Authorities begin in this matter?

Just as in the case of houses, they have only power to interfere after their condition has become so defective as to be dangerous to health, so with regard to disease produced by milk it is their duty to interfere after disease has been caused by the consumption of the latter; but the duty of preventing the infection of milk, like the duty of preventing the erection of improper houses, devolves upon another body which has not even the aid of a medical officer to advise it in these important matters.

Take again such a question as the protection of Londoners against small-pox by vaccination, this is no concern of the Sanitary Authorities. Vaccination is the business of the Guardians of the Poor; small-pox, the result of neglect of vaccination, that of the Sanitary Authorities. Thus the Sanitary Authorities have absolutely no control over the chief means of preventing one of the most important diseases with which they may otherwise have to deal.

Or let us take the provision of hospital accommodation for infectious disease. The large hospitals existing for this purpose are the property of another Board with which the Sanitary Authorities have no connection.

If the subject were not too serious, it would amuse my hearers to learn the difficulties of dealing with a person suffering from infectious disease. Any one not conversant with Metropolitan Local Government would naturally assume that the only questions of importance which could be asked in such a matter would be whether the individual was suffering from a dangerously infectious disease, whether he was so situated as to be a source of risk to others; and, if so, whether his removal to hospital would be attended by danger to himself.

But these considerations under existing arrangements sink into insignificance beside the momentous question whether

he is a pauper or whether the relieving officer will be willing to regard him as such to ensure his removal to hospital. Should he be so unfortunately situated as not to be a pauper, or should the relieving officer have his own ideas as to what constitutes pauperism, his chances of removal are not of the best. His friends may, perhaps, by payment procure his admission into the charitable institution at Islington or at Highgate, or perhaps the Sanitary Authority of the district in which he dwells may undertake this duty; but suppose for one moment the limited accommodation at these institutions is exhausted, there is absolutely no provision whatever for such a person under these circumstances, and he must remain in his own home to be a cause of disease, and perhaps death, to others.

We may learn, too, something of the procedure which is adopted before the removal to one of these hospitals of a person suffering from infectious disease is possible.

It might be thought that it would be sufficient for the relieving officer, before ordering the removal of any person, to be satisfied that there is medical evidence to show that the latter is suffering from infectious disease. This is, however, not enough. The certificate of the most eminent physician in the kingdom is useless for such purpose. The relieving officer is merely concerned with the classification of paupers, and for this purpose the certificate of the poor-law medical officer is required. It is true he may not be accessible at the moment, and the sick person may have to remain in a house containing a number of people some of whom may lose their lives by this delay. But this is a mere detail. The infectiousness of the malady is quite a secondary consideration, and the relieving officer must wait for the certificate of the proper official before authorising the removal to hospital of a dangerously infectious person.

Undoubtedly the whole metropolis derives benefit from the isolation of a pauper who is suffering from infectious disease, and relieving officers will often, for the purpose of isolating infectious persons, permit well-to-do persons to

become paupers, but if they do so they are acting illegally, and thus it is only by disobedience to existing law that those Londoners who are not paupers can hope for this opportunity of preventing the extension of infectious disease among their family.

Moreover, admission to these hospitals by pauperising the inmates disfranchises them, and they are thus deprived of some of the rights of citizenship by their desire to save their fellow citizens from contracting disease. It is true that in view of cholera an Act was passed last year relieving the inmates of this disability, but this Act is not in force after the end of next month, and without further legislation the disability will continue.

The fact comes out but too strongly that the hospital accommodation provided at the expense of the ratepayers of the metropolis is not primarily intended for the prevention of disease, but for the relief of those persons who are known as paupers.

We must not moreover forget that hospitals provided for infectious persons are related to the public health in other ways than those I have stated, their situation in regard to neighbouring houses and the number of patients they may be permitted to contain, are all important in this respect. Surely then it might be urged that the authorities who are appointed to manage these institutions should have as their primary object the prevention of disease rather than the classification of paupers.

It may, however, be argued that in dealing with infectious disease, the existing Sanitary Authorities have very considerable powers. They may, it might be said, compel the removal to hospital of any person who is suffering from a dangerously infectious disease, and is without proper lodging and accommodation, and they may moreover provide hospitals for the reception of cases of fever and small-pox. At first sight this appears to be true, but enquiry soon shows how very little these powers amount to.

It must be pointed out that the compulsory removal of infectious persons in reality is impossible, for the words

"without proper lodging and accommodation" are held to apply to the wants of the sufferer, and not to those of other persons whose lives he may be endangering. If he can be in any way properly tended in his own home, the law does not concern itself as to the safety of other people. So that it is seen that the only persons over whom the Sanitary Authority really have power are those who are already amply provided for as paupers.

But why have not the sanitary authorities themselves erected hospitals instead of leaving this duty to another board?

The answer to this question is not difficult to find. For the thirty-nine different Sanitary Authorities this duty would have been almost an impossibility. It is true that some on the outskirts of London might have attempted to provide hospitals, as indeed on certain occasions some have, but for others the difficulties would have been greater, and although they might have combined for this purpose, they could not have overcome these difficulties as readily as a board acting for the whole metropolis.

What then is the explanation of the fact that there has been really so little thought for health in the government of the metropolis?

I believe the reason is to be found in the difficulties attendant upon the Government of London.

For years there has been a tendency to place upon central boards, although they were not constituted to act as guardians of the public health, duties which should be entrusted only to a body having such important functions.

Whether it be the duty of controlling under regulations cow-sheds and slaughter-houses, of building houses, of taking measures for the protection of infant life, of preventing disease by infection of milk, of providing hospital accommodation for cases of infectious diseases, these duties have been placed upon a central board, and thus the sanitary authorities through being district and not central authorities, have lost control over the sanitary administration of the metropolis. Indeed the only consideration

hitherto has been whether subjects can be best dealt with by a central instead of a district board, rather than whether they had relation to the public health.

The difficulties of district boards are often very great in dealing even with matters over which they have complete control. Take, for instance, the control of the drainage of newly-built houses, a matter which is entirely in their power. London is already years behind many towns in respect to house drainage, although as far back as 1855 the district boards of the metropolis had full powers to insist upon the drains being made "in such direction, manner and form and of such materials and workmanship and with such branches thereto and other connected works and apparatus and water supply as the board shall order."

In practice it becomes almost impossible to insist upon one kind of apparatus on one side of a street while there is no such requirement for the other side of a street which is in another district.

It is indeed but natural that any one authority, before modifying its procedure, should ascertain what its neighbours are doing, and it is but too evident that at the moment it will find them taking no action in the matter. The result is obvious, the authority finds its position would be exceptional and declines to proceed further. It is always easier to decline to move than to take action, and thus there is no difficulty in doing nothing if only other authorities can be found to adopt the same course. I leave it to my hearers to judge how much probability there is that the thirty-nine different authorities in the metropolis should betake themselves at the same time to depart from various methods of their own creation, and which have persisted for a generation, and adopt a uniform, improved practice. Supposing for a moment that instead of one House of Commons there were thirty-nine. Is there much likelihood that they would ever decide in the same manner upon the same subject at the same time? The fault is not so much that of the local authority, it is the fault of a system, and nothing but the alteration of the system will remedy the evil.

There are indeed very many engaged in local government at the present time whose services are of the greatest value to those whose interests they represent, and who would, under a proper system, render great services to London.

I would next desire very briefly to refer to the difficulties with which sanitary administration is surrounded even in so small a matter as dealing with the abatement of nuisances.

First of all the nuisances have to be found, and it must be recollected that the Sanitary Authorities have no right of entry into houses unless they have reasonable ground for believing that the nuisance exists. Even when a nuisance is suspected the owner may object, and then a magistrate's order has to be obtained for the purpose of gaining admittance. The next step is the serving of a notice ordering the abatement of the nuisance. If this be disregarded, application is again made to the magistrate, who affixes a time within which the nuisance is to be abated ; and it is only at the expiration of this period, if the magistrate's order be disobeyed, that a further application to the magistrate will lead to a penalty being inflicted on the offender.

Is it to be wondered at that the proceedings of the Sanitary Authorities often weary the patience of those who have appealed to them for help, and lead to the belief that some negligence or unwillingness to act has been the cause of the delay?

There is no reason whatever why the proceedings should not be much curtailed. It should be a punishable offence if the order of the Sanitary Authority be not obeyed. At the present time no offence is committed until the magistrate's order is neglected, but there is no reason why those who are responsible for nuisances should be permitted to treat the order of the Sanitary Authority with contempt. Appeal to the magistrate by the authority should be only made when it becomes necessary to apply for a penalty.

Under the 35th section of the Sanitary Act, regulations may be made with regard to houses let in lodgings, and

right of entry may be obtained and proceedings thereby shortened. As a fact the local Sanitary Authorities have, with few exceptions, not availed themselves of the opportunities these regulations give for dealing more stringently than they otherwise can with tenemented property. Upon this subject I shall not enter further, except to say I have no doubt that could such regulations be made by the metropolis as a whole, they would be more readily accepted and would be found to be very beneficial in their influence.

These regulations do not, however, affect other parts of a district than houses let in lodgings, and for the rest it is necessary to rely upon the clumsy procedure I have described. Nuisances injurious to health, however, are not always thought to warrant interference on the part of the authority. It is only when no trade interest can be prejudiced that the requirements of health are allowed to be considered. The offensive accumulation or deposit which is admittedly injurious to health, but is required for the purposes of trade, is not to be touched by the authority.

But I have said enough to show that the same principle pervades the whole of sanitary administration in London. At the present time no sanitary administration deserving of the name can be said to exist in the greatest city in the world. The local Sanitary Authorities have no jurisdiction over many subjects of vital importance to the public health, and the authorities upon whom these duties devolve are not primarily concerned in the prevention of disease.

Surely it is time that London, with her vast population of four millions of inhabitants, should demand a sanitary administration worthy of herself.

London for health purposes is not merely Kensington and Whitechapel, having some requirements distinct from each other. Disease knows no parochial boundaries. The multifarious details which are alike common to every parish should be attended to by those who have local knowledge, but guided by one common authority which shall have as a chief object of its existence the preservation of the health of the whole population.

SOME DEFECTS IN SANITARY ADMINISTRATION IN THE METROPOLIS.

THE object of this Paper is to briefly consider certain causes of the defects in sanitary administration in London under present conditions, and to point out how much may be done and has been done to meet these defects by organised action on the part of private individuals. I leave it to Mr. Sawell to open the larger question of remedies, which we trust the Royal Commission now sitting will effectually deal with.

Mr. Murphy has most clearly shown that the sanitary authorities are deprived of a great part of their proper sphere of work as guardians of the public health, and that the confusion and division of executive authorities so caused is calculated to cause delay and inaction.

In London, as in other parts of the United Kingdom, we have in every district an elaborate, or at least complicated, organisation for carrying out the numerous Acts which bear directly or indirectly upon the public health.

A staff of Inspectors, whose duty it is to make themselves acquainted with the sanitary condition of all parts of the district; a Medical Officer of Health, under whose direction the Inspectors act; District Surveyors, to whom is entrusted the supervision of buildings and the care that the provisions of the Building Act are duly enforced; a sanitary authority, consisting either of a Vestry or a Local Board of Works, and in either case elected by the ratepayers and responsible for the administration of the Sanitary Laws, and the due care of the health of their district; a Board of Guardians: and lastly the Metropolitan Board of Works and the Metropolitan Asylum Board, having authority over the whole of the metropolis.

Nevertheless we find in almost all parts of London, western as well as eastern, examples of the most deplorable insanitary conditions allowed to continue indefinitely. Human beings still live in dark damp cellars, with little

light and less ventilation. Crowded tenement houses abound in which dilapidated walls, roofs and stairs are the least of the defects—in which the scanty supply of water comes from a filthy cistern, and foul smells pervade the house from broken and leaking drains, from accumulations of all kinds of decomposing refuse in the yard or cellars, or from closets to which no water is supplied, but which are used by sometimes as many as forty or fifty persons. Houses intended for one family are made to accommodate a family in each room without any alteration in the appliances; and in some cases two, three, or even four families are crowded into a single apartment.

And even now, new houses are sometimes erected in defiance of the very moderate requirements of the Building Acts as regards open space, proper building materials, and construction. Houses or streets are condemned as unfit for human habitation, but left for indefinite periods before further steps are taken; or they are cleared of their inhabitants, and demolished, and the site either remains vacant for months or years, or is devoted to buildings which become occupied by comparatively well-to-do people, leaving the original occupants to seek shelter in already crowded adjoining districts.

Adulteration of food is rarely sought for, and when detected is punished by fines too trivial to have any deterrent influence upon future offenders. We read too of cases of virulent infection being kept in crowded houses because it is found that no provision has been made for removal to the hospitals which are ready to receive them, or because it is necessary first to settle the all-important question as to the patient's possessing the essential qualification of pauperism.

There is no doubt that compared with a century ago the improvement is enormous, the death rate of London having been, as Dr. Longstaff and Mr. Murphy have told us, reduced to one half. But this very demonstration of what can be done makes it all the more disgraceful that we still allow even small areas to exist in our midst in which the

death rate remains at almost the old figure. We are told on high authority that in some districts of London, which I need not now specify, there is distinct deterioration instead of progress.

It must be admitted, of course, that some few parts of London are almost free from obvious and avoidable insanitary conditions, and, further, that often the fearful state of matters found in the slums is due to the degraded class by which they are inhabited, and not to any essential or remediable defect in the premises themselves. Still the fact remains that there are thousands of houses which no care and no attention, such as can be fairly required from the inhabitants, will suffice to render healthy dwellings.

Some of the reasons for this are easily found. The laws bearing upon metropolitan sanitation are numerous, as already stated, and passed at different times with different objects, each being more or less modified from its original design in passing through Parliament. Hence it was almost inevitable that there should be discrepancies, repetitions, and important omissions, and that the powers and mode of procedure should vary much in different cases; thus multiplying authorities and dividing responsibilities, where unity is needed. Moreover the provisions are in too many cases optional, merely empowering the Sanitary Authority to take action if it thinks well to do so; the definitions and specifications are often so indefinite and elastic as to leave room for wide divergences of opinion and action; and the method of procedure is dilatory and tedious, even in many cases where prompt action is obviously essential. Unfortunately the Public Health Act of 1875, which to a great extent summarised all the preceding Sanitary Acts, does not apply to London. Still, granting all the many faults in the present state of sanitary law, it must be remembered that it is none the less incumbent upon the Sanitary Authorities to faithfully exercise the powers that are especially entrusted to them alone; and to their default in so doing are attributable many of the present evils. It would be easy to name

districts in London where the present laws, properly administered, are found sufficient to maintain a high degree of sanitary efficiency, and one of the speakers at yesterday's conference gave us a case in point. The mode of procedure under the Nuisances Removal Acts, for instance, may be, and is, unnecessarily slow and cumbrous, but even the most apathetic of the Sanitary Authorities deal with *some* nuisances under them, while leaving others, as bad or worse, untouched.

Want of legislation cannot be pleaded as the sole cause of the shortcomings of a Sanitary Authority which deliberately refuses, as some have recently done, to accept the direct offer of full powers to deal thoroughly with one of the greatest difficulties of all, viz., tenement houses.

The staff of sanitary inspectors is as a rule utterly inadequate, and for this the Sanitary Authority is responsible. The inspectors are liable to dismissal at the pleasure of the Sanitary Authority, uncontrolled by appeal to any central board, as is most properly the case with the Poor Law officials. Repeated and careful inspections are necessary for efficient supervision, more especially of tenement houses, and the absurdity of allotting to one man, however zealous an officer he may be, a district with a population of 50,000 or 60,000, is obvious; yet this proportion is in many cases an understatement of the real facts.

The district surveyor is responsible for the due observance of the Building Acts, but is hampered by the extraordinary condition that he is personally and individually liable for all costs that he may incur,—unless he wins the case, and is fortunate enough to recover them from the defendant.

With the Sanitary Authority rests the responsibility of taking the initiative in active measures, and in many cases it is reluctant to do so. All sanitary action means expense, and short-sighted economy too often interferes with due care for the public health. Then it may be that those whom it is proposed to compel to do their duty are colleagues or influential persons in the district, while those

who would be benefited are of comparatively little account. It is easy to give plausible reasons for a do-nothing policy. For instance, we may be told that we must not deal with overcrowding, because it would be cruel to deprive people of their homes—which philanthropic principle logically carried out would lead us not merely to tolerate whatever degree of overcrowding may happen to have been reached at the present time, but also any further extension in the same direction. Again, it is sometimes urged that it is unjustifiable to condemn, say, an unwholesome cellar-dwelling, on the ground that poor people must live somewhere; and that it is simply a question of supply and demand, the occupation being purely optional on their part. There is no humanity in allowing human beings to live in such dens, as some of their still existent dwellings are—and our regard for the sacred law of supply and demand does not deter us from making it illegal to offer for sale unwholesome or adulterated articles of food, at however low a price.

It is not found that the poor die of hunger in consequence of the prohibition of the sale of unwholesome food; and when the Authorities muster courage to do their duty, it will doubtless become equally plain that the abolition of insanitary dwellings does *not* drive people to die of exposure in the streets.

There being an insufficient inspecting staff to search out the insanitary conditions, or even perhaps to deal with them when known, there is the further difficulty that those who suffer the injury are often reluctant to call the attention of the authorities to them. This is due to many causes, not the least being the fear that their complaint might come to the knowledge of the landlord or others, and so lead to unpopularity, or even eviction; so that they naturally regard the insanitary condition as the less of two evils. The experience of those who do complain is often not encouraging; long delay being followed by partial, if any, improvement in the end.

Such are some of the anomalies of the present sanitary

administration of London. In part they may be inevitable; but with simpler, more direct, and more explicit legislation, earnestly administered by an efficient staff and a Sanitary Authority worthy of the name, very much of the present deplorable state of matters would disappear. A change for the better cannot now be long deferred, even in those districts which have won for themselves an evil notoriety by their persistent neglect of sanitary measures. We have in the common lodging houses, which are under police supervision, an example on a small scale of the beneficial results which may be looked for when tenement houses are brought under stricter regulations, and efficiently inspected and controlled.

Meanwhile much may be done by individual and collective action in organising public opinion. The poor should be educated as to the vital importance of healthy homes and healthy surroundings, and the means by which unhealthy conditions may be avoided or remedied. The attention of the sanitary authorities should be called to all unhealthy conditions which can be found, and care be taken that the evils so reported are remedied, as far as possible.

The gratifying success which has so far attended the Sanitary Aid movement shows the practicability and value of such organised action on the part of the public. Upwards of thirty Local Sanitary Aid Committees have been formed in connection with the Mansion House Council on the Dwellings of the Poor, each committee working in its own defined district of the Metropolis. Although but a few months have elapsed since their formation, upwards of five hundred cases in all came before them during the month of April alone. By enlisting the sympathy and co-operation of all, and particularly of those who come in contact with the poor, irrespective of sect or rank, it is sought to obtain information of all insanitary conditions in the district; and when satisfied of the correctness of the information, to transmit it to the proper authorities, *in the name of the Committee.* Each case so reported is watched by the Committee until satisfactorily completed Those who give

information, whether they be the actual sufferers or others, learn to trust in the assurance that under no circumstances is the source of the information divulged, and learn, moreover, that their complaints, if well founded, will be taken up, and pressed if need be. The authorities, on the other hand, gain information which they could not otherwise obtain, of insanitary conditions requiring their attention and action, and learn, too, that the complaints so reported are well founded, and will not be allowed to drop, until satisfactorily disposed of.

The Sanitary Aid Committees are also charged with the duty of spreading information upon all subjects bearing upon health, and the promotion of public health by all means in their power. An excellent account of the work of such a committee will be found in Miss Marryat's admirable paper in the *Nineteenth Century* for April.

The action of the Local Committees has led to greatly increased work being done in the sanitary department of each district, and in many cases their help has been cordially welcomed by the medical officers of health. In several districts procrastination is the great difficulty. In some of the worst the committees find it difficult, at first, to get the authorities to pay any attention to complaints, and it is easy to understand what would be the fate of any complaint from a private source in such cases.

This work is in great part work which ought to be done, and will be done at no distant future, by the sanitary authorities themselves; but it is probable that, after experience of the benefits arising from the "Sanitary Aid," many of the duties undertaken by the committees will prove to be a permanent charge, arising out of the necessities of our social system. Whatever may be their lot in the future, they are now doing good and lasting work in coping with some, at least, of the present defects of sanitary administration.

"SUGGESTIONS" TO THE ROYAL COMMISSIONERS ON THE DWELLINGS OF THE POOR.

WE make no apology for the selection of the title of this paper. The subject is essentially a people's subject. Referred to and mourned over by such periodicals as the *London City Mission Magazine*, *Scripture Readers' Journal*, and similar publications, for nearly half a century, the recent suddenly awakened interest in the question is due to the writings of "One of the People," assisted by the generous, and I will add, audacious enterprise which now characterises the proprietors of our illustrated weekly press. It is nothing new to their artists to mingle in the fray of the battle-field, or to penetrate the tangled forests of India or America, but it was worthy of the Victoria Cross for one of them to encounter the poisonous miasma of the wretched courts and alleys, the garrets and cellars, which in this nineteenth century of the "Gospel of self-sacrifice" still disfigures and disgraces this so-called centre of Christendom. All honour to-day to Mr. G. R. Sims and Mr. Fred Barnard and the proprietors of *The Pictorial World*, with others, in bringing to-day the West End face to face with the East End, and making St. James and St. Giles—Dives and Lazarus—acknowledge a common brotherhood.

"The people" having originated this fresh discussion of a very old subject—and we fear, considering the innate selfishness of man, the poor will ever be among us, as a Divine trust—it is to be hoped that "the people" will keep it in their own hands. "Royal Commissions" and Select Committees have before to-day proved broken reeds, and it requires but little acquaintance with the ways of "Parliament" to have discovered that "from the days of John the Baptist until now, *that* kingdom suffereth violence," and only "the violent take it by force." The day seems to have gone by when statesmen read the public mind, and

anticipated the demands of the people. Without "pressure from outside" nothing will be done on this, or, as it seems to me, the concurrent question of "Local Option," in some form or another.

Still, in selecting the bold subject of this paper, I did so with the understanding that I should only be regarded as the footman to open the door to others, or the maid-of-all-work to take down the shutters, and thus let in a flood of light into a certain room in Richmond Terrace. All I expect to accomplish, therefore, on this admittedly intricate subject, is to make a little running for the real horses on this occasion.

Most heartily do we re-echo the noble words of Prince Albert Victor—to be at some distant day, let us hope, the future king of these realms—words well worthy of his noble ancestor, the Prince Consort, who ever took so deep an interest in this great question: "Nothing is more worthy of the building up of a wealthy commonwealth, than that all classes and parties, whether political or religious, should unite together in the attempt to better not only each other, but the whole."

My first "suggestion" will be that, as with all social reforms, we can expect no immediate and magical transformation in the condition of our poor. The thing is, to get on the right tack. Character lies at the foundation of all true progress, and the moral and religious condition of vast masses of our fellow-citizens constitutes the greatest difficulty which lies before us. We may clear away "the rookeries," but unless with this we also seek to change the habits of the rooks, we shall have advanced but little. How are you to compel a dirty woman to be clean, to make her bed, to sweep her floor, to wash her children, to open her window? has often been despairingly asked. The only true reply is, by changing, not her house, but her character, and this is most surely done when she is "*made a new creature in Christ Jesus.*" Having said this, however, we must also remind you that character is ever largely moulded by surrounding circumstances, and that if it be true

that immorality and vice are the creators of bad dwellings, it is equally true they are often their products. A "Kaffir hut" is found, by our missionaries abroad, to be a great hindrance to their work, as a very hot-bed of vice and iniquity; and so also to our home missionaries are "the rabbit-warrens" in which, through stress of circumstances, and what we unhesitatingly call "the monopoly" of house accommodation, the great mass of our poorer brethren are compelled to bury themselves.

My second "suggestion" to the Royal Commissioners, therefore, is this, that the housing of our poor has become *a practical monopoly*, and that all monopolies of what is "a necessary of life" being wrong—and surely a decent dwelling is a necessary of life—this particular monopoly must somehow be destroyed. Bentham's famous axiom and true guide to all great political questions, "the greatest happiness of the greatest number," remains true here. In face of this, all "vested interests" and "private rights" must give way, though, we add, with such equity as may be possible in each case.

That there is a practical monopoly of dwelling accommodation for our labouring classes no one acquainted with them will doubt. They have no choice, "no help for it," as they say. "If you don't like it," the landlord says, "pay what you owe, and go." And live near their work many of them *must*. "We know," said one, "this place is not fit to live in, and we should be glad to get away from here and get farther out, but we must go into shop several times a day. This bit of work I am doing is wanted in a hurry, and I must have it in in time, and then perhaps I shall not get any more, but may have to look in in the course of the day. I go, and there is nothing for me. Then I am requested to look in again next morning. I look in next morning, and I get work out that I have to finish and get in again in the evening." And there are thousands upon thousands of such people who are thus dependent on city shops and warehouses for this kind of work, to say nothing of those who work at the docks, and others who do the "job-

work" of our streets. And yet such poor unfortunates have to pay on an average 3*s.* 9*d.* for some miserable room, in which often a family, consisting of husband and wife and six or more children, are herded more like wild beasts than human beings. "Upon my word," said one poor woman about to be turned out of her wretched hovel by one of those "improvements" which have been so immensely beneficial to "ground landlords" and landlords of every degree, but which have proved utter bankruptcy and ruin to small tradespeople, and the most thoughtless and inhuman cruelty ever perpetrated under the name of "advanced civilisation" to the honest poor of our city—"upon my word, it is no use trying to get rooms, for as soon as people know you have children they shut the door in your face." We who live in purple and fine linen, or at least a long way off Shadwell, Whitechapel, or Kent Street, may pride ourselves on our broadened thoroughfares, our grand new Law Courts, and our magnificent Midland Railway Station, but are they not all constructed out of the flesh and blood of our fellow-creatures? With about as much pity as we have for stones, to effect these improvements the poor have been *crushed together*, "piled on heap." With them overcrowding has greatly increased in the remaining low neighbourhoods, it is generally admitted, and is well-known to every city missionary; and with this overcrowding comes, of course, "the monopoly" of which we complain, and the consequent rack-renting of the labouring class. The rents in St. Giles have risen 35 per cent. (Mr. W. Harrison, Home Missionary.*) "The poor pay so much and get so little, and almost fight to get it." We give the following illustration of this overcrowding:—

"The subject was brought before the vestry of St. Luke's, Old Street, at an ordinary meeting by Mr. G. S. Lucraft, who called attention 'to the unsanitary condition and disgraceful overcrowding of houses in the parish,' and moved that the medical officer should be instructed to

* See a remarkable article, confirmatory of this estimate, in Chambers' 'Edinburgh Journal,' for Nov. 13, 1841.

inspect and report upon these houses. Mr. Lucraft described at length the shocking condition of many of the habitations in Whitecross Street, Banner Street, Blackman Street, and other thoroughfares, and stated that the conditions under which the people lived in some of these places were revolting in the extreme. In Banner Street, in one place little better than a washhouse, a woman and five children lived; the bannisters were all broken away, and the dust heap was an accumulation of months past. In one place the water closet was used by from twenty-five to thirty people [How can womanhood exist under such arrangements?], and it was in a perfectly dark place and in a disgraceful condition. A family of eight slept in one small room, and at one house in Whitecross Street in order to get to the water closet it was necessary to go down a dark and narrow staircase, and to pass through the soil coming from the water closet. On the first floor of one house, the numbers of which were all given, a man, his wife, and four children lived and slept in one room, and in the daytime carried on the trade of a 'boot translator.' At one house, close to a water closet which was in a most shameful condition, the trade of making ice-creams was carried on; and in a top front room a tailor and his four children, one of them a daughter aged 22 years, lived in one small room and earned their livelihood. Mr. Lucraft gave these details at great length, and stated that in most cases the landlords were large owners of property of a similar character. In the top attic of one place, where the rent was 1*s.* 9*d.* a week, an old woman lived who 'took in a lodger,' and here the business of rag sorting was carried on. The whole of these houses were without proper water supply, and although the sanitary committee of the vestry had the power to order and see that improvements were carried out, this had in many cases not been done. In some of the houses nothing had been done for years, and the wretched inhabitants had no opportunity given them of possessing a cleanly home. It was high time something was done."

After, say, a quarter of a century of work in this direction, Sir Charles Dilke even admits only a slight balance in favour of improvement, and, meantime, remember the great, and to my mind, alarming gulf between the rich and the poor—the unbridled luxury and extravagance of the upper classes, with the comfort of the middle, and the hopeless misery and monotonous penury and wretchedness of the toiling millions has widened.

Illustrations of this "rack-renting" of our poor might be given in abundance. As a rule the middle-man, the apparently inevitable evil companion of our poor, hires a house at 10*s.* per week, and lets it out at 17*s.* 6*d.* per week. Here, *ex. gr.*, is a house in Prince's Street, Bethnal Green, worth 9*s.* to 10*s.* per week. It consists of six rooms, with a family in each room—forty persons in all—and brings in £1 3*s.* 9*d.* per week. Generally, it may be said, "houses are let to 'house-farmers,' instead of being let to respectable tenants, and these house-farmers let to anybody who will pay the rent, and they care little for the condition of the house." Mr. Brooks, a fifty years' resident in the parish of Clerkenwell, at a meeting gave as an instance that of a house in Percival Street, for which not more than £20 per annum was paid to the superior landlord, and yet for which the "house-farmer" was realising as much as £1 1*s.* per week.

"Mr. Lowe [of the same vestry] remarked that there were many places in the Charterhouse district which could only be described as a nest of poverty. The property was let to grovelling house-farmers, and he (the speaker) knew of one case where a poor woman paid 3*s.* 6*d.* per week for a miserable little room not worth 6*d.* Therefore, it was the house-farmers who should be attacked, and when it came to the point, he (the speaker) would use all his influence in breaking down the system." Men take up this house-farming as an occupation, buy up the fag-end of leases, and, having "rigged the market," grind the faces of the poor. "The reason for the overcrowding in certain parts of London," says Mr. Marchant Williams,

Superintendent of School Board Inspectors, "was due to the labouring population having to reside close to their work; *so that the landlords were masters of the situation, and could charge what rents they pleased.*" The following corroborative statement also appeared in the *Daily Telegraph*: "As for the rent, only that I have been privileged to look through at least a dozen —— Street [near Norton Folgate] rent-books, I could not have believed it possible they could pay as much for such shockingly dilapidated holdings. To say that these filthy, crazy, and unwholesome tenements realise more to the owners than a handsome villa residence with a corresponding number of rooms at Hampstead or Bayswater could be hired for, is to not overstate the case. I will take one of the 'dark' houses above-mentioned, which contained eight rooms, each being occupied by a separate family. The top floor—which was originally two rooms, now knocked into one, with a slanting attic roof at one end not more than four feet from the floor—let for 4*s.* 9*d.*; next floor—front room 3*s.* 9*d.*, back 3*s.*; next the same; parlours—front 3*s.* 3*d.*, back 2*s.* 9*d.*; total, £1 4*s.* 9*d.* weekly, or £64 17*s.* 6*d.* per annum. I need not quote any other instance, inasmuch as nothing can be more certain that, if lodgings could be procured in the immediate neighbourhood at a lower rate, the 'dark' house in question and the others as well would speedily be untenanted. It would be a waste of words to argue that persons who are so ill-paid for their labour, and who are so poverty-pinched that a 'rise' of a halfpenny in the price of a loaf necessitates an immediate curtailment of some less imperative necessary of existence—the morsel of dripping that ameliorates the dryness of the crust, or the driblet of milk that makes the cup of tea more palatable—would not fail to use every endeavour to obtain lodging as cheap as possible. They pay as much as they do simply because they cannot get what they require for a less sum."

This brings me to *the third suggestion*—on the system of leases. Happily this subject is now engaging public attention. It seems to me to lie at the root of the whole question. Shall

a man build to enrich himself, or others? If the latter, experience has shown us what class of building we are likely to have. Land in large towns and cities is necessarily a monopoly, and being so, I contend the governing authority is bound to consider "the greatest happiness of the greatest number," and not the private interests of a few noble land monopolists. "The unearned increment" of a 50 or 90 years' lease surely belongs to those who have given the land its additional value, and if this "unearned increment" is to revert to anybody, let it revert, we say, to the people themselves through their representatives, the town councils. The whole of Manchester is built upon land for which no cash value has been paid by the builder, but only a yearly ground-rent; but in Manchester and elsewhere, the ground-rent is a *perpetual payment*, and so long as it is paid, the houseowner is absolute owner of the land, free from interference. If I agree to pay a fair sum for a piece of land in the year 1880, and then proceed to improve that land, to make it indeed of any value at all, by erecting a house, &c., why in the name of common equity should my children be deprived of my improvements in the year 1979? You say, it is in the agreement. My reply is, then the agreement is founded on injustice, as, owing to the monopoly in land, I had no alternative. "Accept, or go," is the fiat of the ground landlord—the monopolist."

A party writes:—One bought the interest of a small tumble-down place with stables, at a ground-rent of £65. He pulled the place down, and rebuilt the whole suitable to his business, at an outlay of over £3000. Thinking that, having the direct lease, he should get a renewal at a fair ground-rent, he applied in due course for a renewal; the agent came, inspected the place, inquired if he did a good trade, and said, he (the agent) supposed he would not care to leave. My friend received the terms in due course, and they were as follows: Ground-rent £300 per annum, a fine of £200 to be paid at once, lease five years. On my friend pointing out that the premises had been built by him, he was told, 'Everything what stands on the land is ours.'

I have also known cases where people could not comply with such large demands, had to leave their houses and business, and are now working for starvation wages. Such a state of affairs is simply scandalous, and the chief cause of the state described in 'The Bitter Cry'—in fact, the natural outcome of it, if one man has the power to seize the produce of so many thousands of London toilers."

That the continuance of such monopoly is contrary, not only to justice, but also to public policy, we see in the kind of "Jerry-building" we have at the *commencement* of leases, and the mass of decaying, insanitary, tumble-down, fever-breeding houses, relegated to our vestries, that is, the public to keep in order, at the *termination.* Who created the human ghouls, the house-farmers, that now fatten on the carcases of our poor? The ground-landlords of 70 or 80 years ago. They or their children, sitting with folded hands like the gods of Olympus aloft, are simply waiting for the improved ground-rents, which their rotten property, with 7 or 10 years' lease to run, and which no sensible, honest man of course can touch, and for which they have simply done nothing—not even looked after it—will soon yield.

And, let it be added, as if by way of irony to all this, our legislators—being, of course, not ground landlords themselves—most generously relieve the ground landlord from all contribution to assessment for local rates and for improvements effected by the Metropolitan Board. Yet these improvements have often nearly doubled the value of their freeholds, while the interest of the leaseholder decreases yearly! Take Golden Lane and Grays Inn Road, for example. The following instances were given in a local newspaper :—

"A ratepayer, with a wife and small family, who opens his shop at 8 A.M. and closes it at 10 P.M., finds himself, with all his care and self-denial, gradually getting poorer and poorer, while his rates are becoming higher and higher—sends us a statement showing that for the same house he now inhabits, whereas he used some years ago to pay £16 a year for rates, he now pays £30, to enable him to do which

he and his poor little family have to make such sacrifices as reduce his living to the mere necessaries of life. A few years ago the street in which he lives was widened. It was not of the slightest benefit to his trade, but rather the contrary, as people hesitate to cross a wide street; but his landlord immediately raised his rent, and his rates were, of course, raised in proportion; in addition to which he had to pay an increased rate for the cost of improving his landlord's property. Another who carried on business in one of the principal city thoroughfares, was paying the enormous rental of £800 a year, his gross profits being £1500. The street was improved, as it is called, and his rent increased to £1000. So that out of the £1500, the annual profits of his life of toil and anxiety, his grasping landlord, who literally does nothing but watch for an opportunity of getting a little more, takes two-thirds for his share, and the poor struggling tradesman has the remaining one-third left for his share, out of which he has to pay an enormous sum for rates, which sum was increased by nearly £40 a year by the improvement which had already cost him £200 a year, which his landlord had received without the expenditure of a single shilling! If these be but examples of what is going on around us, who can sufficiently admire the astonishing amount of patience with which this crying iniquity is borne?"

If you refer me to the good order and tenantable condition of the property on the large estates of our big ground landlords, I remind you that our subject to-day is *the dwellings of the poor*, and what have these big ground landlords, as a rule, done for them? Why, *improved them away* as so much scum. Yet have not the poor an equal right to live as the rich and middle class? Has "public policy" or "self-interest" been consulted in this great question? All success then, we cry, to Mr. Broadhurst or Lord Randolph Churchill! We don't care which, so long as the people come by their rights, and have that *security of tenure and compensation for improvements* now conceded to the smallest improver of the smallest patch of Irish bog or mountain.

My time is limited, but I would record my own deep conviction that we are but playing with this great moral as well as social question, in face of its admitted urgency, if Parliament does not grant to town councils summary powers, some Draconic law, "a rough and ready" process, of acquiring, after a three years' option to the existing owners to rebuild, according to plan—at a *specified price* per square foot, say five shillings—not only insanitary property, but also any respectable, yet, for the locality, most unsuitable small property it may think it desirable to purchase to relieve the congested population. The site question is the crux of the whole difficulty. And if existing small property can be found to pay even superior landlords on such sites, say, as lie between the River and the Metropolitan District Railway at Westminster, why, unless exorbitant figures are demanded in the transfer, should they not pay still better with artisan dwellings upon them? Let public trustees be appointed for a term of years by the town councils, and with consols at 2½ per cent. no difficulty should be experienced in creating a Mortgage Town Trust, safe even for widows and spinsters, at 4 per cent. I would extend this power to purchase by arbitration also to public bodies, such as the City Companies, which were originally, I believe, established to benefit the industrial classes. What better could they do with their hoarded wealth? And here, I would remark, that only by the system of flats, such as we have in the industrial dwellings, can the poor be rescued from their present squalor and moral degradation, if they are to live in the vicinity of their work; and it is found that these improved dwellings pay commercially just as they *are* contiguous to the work of their inmates.

But, of course, we all know the present "improved dwellings," including the "Peabody," accommodate only those who earn from 23*s.* a week and upwards. This brings me to my fourth hint. 23*s.* a week for man, wife, and say four children. What an enormous sum! Is it not a disgrace to our political economy and to our Christian

brotherhood, that any poor, honest, industrious working man should earn less?

My fourth suggestion, therefore, the most important to my mind of all, still has respect to a monopoly—and remember my whole argument is based upon the assumption, that no monopoly of what is a "necessary of life" has a right to exist, as being contrary to public policy and the interests of the whole community—the monopoly of land *in the country*. People smile at me, and say "nothing is easier than to buy or rent land." I grant it. Most true if I want to buy or rent 300, 400 or 500 acres; but most false if I want to buy or rent one, two, or any small number of acres. The agricultural population of our country decreased 10 per cent., or 91,550, between 1871 and 1881. And *what* are the inducements offered to our industrious poor to remain in the country? Did God Almighty create the land to afford pastime to a few great landlords, or to grow corn and herb for the service of man? This migration from the country districts to the towns must be checked; and not only so: we want a migration from the towns to the country, if the cries of socialism and communism are to be stopped. A land hunger is coming upon the people, and I greatly fear, if they cannot obtain this "means of subsistence" by honest means, Mr. George's dishonest means will gain their attention and support. "The London poor," as even *The Standard* bravely says, "cry out for fresh air, decent accommodation, and house room that will not make it a necessity that their children should form the ranks of the underground. If political economy does not see its way to granting this request, *self-preservation* perhaps will see it better. And it is high time that it opened its eyes. We may rest assured of that."

With the old race of English yeomen again encouraged to occupy their small freeholds, instead of being improved off the land for the rearing of deer, for turning it into sheep-walks, or the cultivation of game, some of the £26,000,000 given to the foreigner for eggs, butter, vegetables, cheese, bacon and ham might

be produced at home, to say nothing of "jam," when the extraordinary tithes are gone, and not before. Until our political economists can relieve our large towns of their plethora of hands, with its consequent acute and inhuman competition for labour—leading to shirts made at 1*d.* or ¾*d.* a piece, trousers-finishing at 3½*d.* or 4½*d.* per pair, match-boxes at 2¼*d.* per gross, the maker finding brush, paste, fire and factory—thus making the country *more* attractive and large towns *less* so, I see no hope of properly housing our poor in any decent fashion, except by way of charity—i.e. the imposition of rates on the honest and industrious. What accommodation, commercially, can you offer to men and women earning their paltry 10*s.* to 15*s.* a week. Can anyone keep body and soul together, clothe and educate children, and *pay rent* on such a pittance? Let us go to the root of our difficulty. We want some one to arise who "will make a man more precious than fine gold; even a man than the golden wedge of Ophir." Meantime I would suggest that Hood's "Song of the Shirt" be occasionally sung and preached from in all our churches and chapels. Religion must no longer be divorced from those questions which concern the working-man every day of his life. The Gospel must be applied as well as preached. And for interference in this particular monopoly, in the interests of the whole community, "the greatest happiness of the greatest number," I can at least quote the authority of our Premier, Mr. Gladstone. In a speech at West Calder, he said, "Those persons who possess large portions of the earth's space are not in the same position as the possessors of mere personalty. Personalty does not impose limitations on the action and the industry of man and the well-being of the community as the possession of land does, and, therefore, I freely own that compulsory expropriation is admissible, and even sound in principle." *

The following letter on the whole subject was sent to

* The extension of the principles of the Highland Crofters' Commission to all the village and town communities of the United Kingdom is all that is required.

me by Professor Thorold Rogers, M.P., when convening for the Lord Mayor the conference at the Mansion House :—

"Sir,—Your letter has, after considerable delay, reached me. I am afraid that I shall not be in town on the day you specify. I have, however, little doubt as to the causes which aggravate the condition of industrious workmen in the matter of rent, I being—as the Lord Mayor, who is our banker, knows—director of a very successful artizans' dwellings company. The causes are these :—

1. "The accumulation of land in large towns in few hands by wealthy proprietors and corporations. It stands to reason that if a considerable portion of a limited quantity is kept out of the market, the price of what is offered will be greatly heightened. If it were possible to conceive that the amount of gold in a country is a rigid quantity—that a large quantity of this were taken entirely out of circulation—the price of the residue would be greatly increased; or what is the same thing, the price of everything else would ruinously fall.

2. "The custom in England is to put all local taxation on the occupiers and none on the ground landlord. In London this amounts to nearly one-third of the rent, and is becoming an intolerable burden. The ground landlord is enriched by population, and his estate permanently improved by the occupier.

3. "The costs of conveyance, and indeed, of all transactions connected with real estate, are enormous. The legal charges constantly amount to a year's rental of moderate-sized properties, and two or three years' of small properties. It is said that the legal charges incurred in the transfer of land in England amount to twelve millions annually, and nearly the whole is more than wasted.

"Our American kinsmen do not submit to any of these abominations. We do to all, and, in consequence, England is becoming rapidly honeycombed by socialism, though it should be, and hitherto has been, more free from this distinctive folly than any other civilised country. If these

tenets spread, it is plain enough to me who is answerable for them, though it is not quite so plain that they who should suffer will be the only victims."

I can now but specify the other considerations which must engage the attention of the Royal Commissioners.

1. First and foremost, the Licensing Question. I quote the words of one of our oldest and wisest city missionaries, when on a district in Bethnal Green:—"The place is honeycombed with public-houses, and these are crammed to the doors; and one of the most sickening sights is to see the women hunting for their husbands, to obtain the price of Sunday's dinner, ere the week's wages are spent in drink. But often it is the little toddling child crying pitifully, who comes to search both for father and mother, who are to be found in a state of semi-drunkenness at the bar. Worse still, these places are crowded with young women, whose faces ought to bear the blush of maidenhood, drinking from house to house with the debauched-looking youths, who have long ago left the ingenuousness of youth behind them in their lives; and as midnight tolls, the young men and women reel out in the worst state of inebriety; then the wife-beating, the domestic jangles, the immorality proceed."

I can only here state my own opinion, that the number of those who tempt will always measure the number of those who fall. Limit the number of the "body-and-soul traps" of our working classes, and you will in the same proportion lessen the social misery and moral degradation everywhere met with. In the Finsbury division of the London School Board, Mr. Marchant Williams informs us that for every efficient elementary school there are more than eight public-houses—(number of schools, 111; number of public-houses, 912). What the Royal Commissioners have to do, therefore, is to devise measures for diverting the money now spent to enrich the publican, the brewer, or the gin-distiller, into rents, clothes, and good food. And until this is done, our working people will never rise to that great and sacred principle of *self-reliance* which *must* be

maintained if we are not to become a nation of paupers and slaves.

A professional surveyor, who is well acquainted with the value of the property, estimates the money expended in the twenty-six public-houses and gin-palaces (in the streets running out from the Seven Dials, St. Giles) to amount to £1040 per week, or more than £52,000 a year (Rev. G. W. McCree in paper read before the National Association for the Promotion of Social Science).

2. The registration *after* all necessary structural alterations, and weekly or monthly inspection of all houses let out to more than two families, *by the police*, after the manner of the licensed lodging houses, and *at the expense of the owners of* such houses. Why the general public should be required to keep *private* property in a proper sanitary and tenantable condition, I cannot see. Fees for registration should therefore be charged sufficient to pay the necessary cost of periodical inspection. I greatly fear that until we make the possession of unwholesome and overcrowded dwellings *penal*, and perhaps imprison a ground-landlord or two, and, say, half-a-dozen house-farmers, on the ground of *slow-poisoning*, we shall do little. Filthy and destructive tenants would soon cease to exist under such police regulations.

3. The owners and agents of proved insanitary or other bad property should, *ipso facto*, cease to be members of vestries and sanitary inspectors, as in the case of vestrymen accepting parish contracts.

4. No tenement houses with open street doors at night should be allowed. It is a crying scandal that whilst the tramps and vagabonds who abound in our licensed lodging houses are protected and have at least a modicum of decency secured to them, the honest and industrious poor who live in these abodes are entirely neglected and left to the mercy of avaricious landlords. These tenement houses, with their open staircases, upon which an unlimited number of outcast wretches, too poor to pay for a bed, come in at all hours of

the night for the sake of mere shelter, and perhaps to snatch a few hours' repose, are the veriest hot-beds of vice, and yet, owing to the extortionate rents charged elsewhere, respectable parents are unable to shield their children from this most fruitful source of contamination. Dr. Gibbon's (Medical Officer for the Holborn District) remarks on these are well worthy of attention. "Dr. Gibbon has given a definition of a 'London rookery,' a place which, he says, promotes at the same time practical communism, ignorance, and immorality. The origin of a 'rookery' is that a house built for the use of one family is made, second, third, or fourth hand, to contain six or more families, who use the street-door, passage, staircase, washhouse, water closet, dust-bin, and other sanitary appliances in common; and in the vast majority of cases there is no deputy-landlord or caretaker to see that these common and necessary appliances are kept in order and not abused. The consequence is that, under the influence of this practical communism, all tenemental houses soon degenerate into rookeries. No tenemental houses will ever be in a clean and satisfactory condition until the Legislature either absolutely prohibits the closet, the dust-bin, and the washhouse from being used in common by five or six families, or compels the owner of every tenemental house to provide a resident caretaker of the street-door, staircase, the water closet, and dust-bin, and the other sanitary appliances that are used in common by the inmates. Until one or other of these enactments is made by Parliament, Dr. Gibbon believes the so-called 'rookeries' will always exist in London. The character of the 'rookeries' would be greatly improved if Parliament chose to place some limitations or restrictions on the enormous amount of street trading now carried on in the metropolis. The worst of these tenemental houses are occupied by street traders, such as costermongers, flower-sellers, newspaper boys, match and fusee-sellers, street singers, beggars, and prostitutes. If our legislators could place some kind of regulation

or restriction upon the street hawkers, none of whom ever take out a hawker's licence, it would be for the advantage alike of the traders themselves and of the general public. With all existing defects, however, Dr. Gibbon believes that the house accommodation of the London poor is infinitely superior to that of many large provincial towns. This opinion is confirmed by the fact that while the death-rate in the metropolis averages about 22, that of Birmingham. Leeds, Liverpool, and Manchester averages from 26 to 32 per 1000 inhabitants."—*Local paper.*

5. The structural alterations required for the registration of any house should at least include a water closet and a water tap for every family, with a specification of the minimum space of cubic feet for each adult (350?).

6. The hours for the inspection of registered houses, and also of the licensed lodging houses, should be extended. At present they are limited, and cannot take place after 6 at night and before 6 in the morning. Hence, as city missionaries well know, a party will let her one room to eight, ten, and even twelve lodgers, who herd together indiscriminately on the floor. It would not be decent to reveal what city missionaries often witness in these rooms and the "Ha'penny Refuges" to be found all over London.

7. As even so cautious a statesman as Lord Derby is prepared to support a plan for the spending of some millions of public money to relieve "the congested population" and poverty of Ireland, I would humbly ask the Royal Commissioners what is the difference of the congested population and poverty of six millions of people in Ireland and the congested population and poverty of the nineteen millions we have in our large towns? What Lord Palmerston said of "dirt" I would say of the poor starving "be-sweated" wretches in our courts and alleys,—they are only money in the wrong place. Put them, or better still, keep them on "the land" they ought never to have left, and they will not only lessen the present frightful and cruel competition we have in our cities and towns, but prove, as every merchant will tell you—if "the land" be in our

colonies*—our best customers abroad. If our Oxford and Cambridge young men, about chivalrously to throw themselves into the yawning gulf, would only become the leaders and organisers of colonies, they would do the State far more service than they are ever likely to do it in our East end slums. Let them try to remove *the causes* of our poverty and dirt. "Prevention is better than cure."

8. On the ground of the enhanced value given to the

* Mr. Hamilton Bromby, a returned colonist from Tasmania, writes: "On returning to England after a long residence in the Australian colonies, the cry one hears of overcrowded, underfed people in London strikes one as indeed strange. That in Australia, at a distance of only six weeks' voyage from England, there should be so great a demand for the very people who here seem to be lying listlessly suffering, but able to do that work which there is waiting for them—that such a state of things should exist, and no remedy be found—seems so strange that I cannot help calling attention to it. Let me take Tasmania as an example of the demand for labour now made in the Antipodes. I take that colony because it is the smallest, and is generally supposed to be the poorest of the Australian colonies. There farmers are in despair, almost forced to give up agriculture, because of the difficulty and expense of getting labourers. From four to five shillings a day with rations would be gladly paid to strong labourers, while at shearing time much larger wages can be obtained. All other kinds of labour are as highly or more highly paid. An unskilled workman—a man willing to work as a bricklayer, for instance—is paid from six to eight shillings for a day's work of eight hours. Skilled labour—carpenters, painters, &c.—is much more highly paid. . . . . It may be said that the Londoner is not suited to agricultural work. My experience in the colonies is exactly the reverse. It is a curious fact that a real Londoner, a true cockney, when he takes to colonial life in the country soon gets ahead of an ordinary bucolic. Whether it is from his greater smartness and sharpened wit, it is notorious there that he soon becomes prosperous and happy, and makes the best sort of farmer. Besides the much higher rates of wages I have mentioned, the farm labourer in the colonies has always an opportunity of tilling a piece of land of his own; his sons can help him, his wife and daughters can attend to the cow or cows and the poultry. He can save money; he can buy, either by auction or by private contract, from the Government on easy terms of credit as much Crown land as he wants, and then, if he chooses to set to work to clear and cultivate it, he will soon find himself a prosperous proprietor, making his own fortune and adding to the wealth of his adopted country."

rates, and the great saving in the bills of mortality and sickness—reckoned to be possible, in London alone for deaths at one quarter of a million (25,000 excess of deaths, £10 each), and £4,236,000 (unnecessary sickness — Mr. Ernest Hart)—all owners of "improved dwellings" should be allowed some reduction in rates and taxes—at least, they should be allowed to compound—a difference of 25 per cent. in lieu of being rated separately for each tenement—and might be free from house tax, as with tenements under £20 per year value. Government or municipal help could at least be afforded in this direction. For it is no small thing to effect for the parish and the country at large, as these dwellings are proved to have done, a lessening of mortality from 40 per 1000 to 16 or 17 per 1000. Mr. Ernest Hart puts the mortality in unhealthy districts, amongst children generally, at 171 per 1000, and in Southwark it has risen to 305 per 1000. But in those poverty-stricken districts the blessing implored by Cybele is bestowed, for as the mothers say, "the best thing to happen to them is to die"! Yet consider the amount thus unnecessarily spent on sickness and funeral expenses. Every human life saved is so much rateable value to a parish. "In Edinburgh the corporation removed 3000 houses at a cost of £533,000, and in 15 years they had received back £443,000, and by the year 1887 every farthing would have been returned to the corporation. What was the result? Fifteen years ago the death-rate of Edinburgh was 56 per 1000: in 1882 it was 18 only."

9. That power be given to town councils and other local authorities to allow of this compulsory purchase of ground for the erection of halls for recreation, baths and wash-houses, churches and chapels, and all other buildings, together with playgrounds, which in their opinion shall be calculated socially, morally, or religiously to elevate the people—any clauses in existing leases, such as those which still disgrace the leases of the Ecclesiastical Commissioners in Westminster, notwithstanding.

10. That Government, or our new central authority,* give encouragement to railway companies, by remission of the passenger duty or by some other concession, not only to run workmen's trains at 1*s.* per week, as is already done by the Great Eastern under compulsion as far as Enfield, instead of the general 2*s.*, when done at all, into all our suburbs, but also to issue "third class" season tickets. Our object should be to lessen, by every means in our power, the congestion of population at the centre. Let us encourage all who *can* live away from their work to do so. And as many of our chairs are made at High Wycombe, many of our gloves at Yeovil and Worcester, and many of our straw bonnets and hats at Luton, might not many other articles now manufactured in our great cities be equally well and conveniently produced in country districts? But pray do not let the new houses and new streets in the suburbs be built like the old ones in the centre "on heaps of slowly putrifying rubbish." (Mr. Kemp at Metropolitan Asylum Board, in speaking of houses affected with small-pox at Homerton.) Read also the following letter from Mr. Vere (city missionary):—

"Dear Sir,—With regard to the fearful fever which occurred while I visited the Charles Street district, Lisson Grove, and again only a few years ago, I think the following may account for its commencement and violence. The road of Charles Street was made up of rubbish covered with gravel, and the people had for years thrown all sorts of filth into it.† This got trod into the ground, making it very unhealthy. After a time the parish decided to pave the road, and began to dig up the ground in hot showery

* Parliament has already given powers to the Railway Commissioners to order sufficient accommodation for workmen's trains, at such fares as they consider reasonable; but, like many of the powers given to 'vestries,' they lack the dynamic force.—(Major Marinden's 'Report to the Board of Trade,' Feb., 1883.

† According to a letter in the *Echo*, June 13, 1884, this wretched plan of constructing new roads is still continued by the Hackney authorities at least.

weather. Fever appeared almost at once. The causes of its rapid spread may be accounted for by the following facts: The bad drains; old water-butts; filthy closets with little or no water; filthy washhouses; insufficient ventilation and light; damp underground kitchens, &c.; objectionable occupations, such as stale fish, vegetables, cats' meat (often in a decayed condition), in the rooms, passages, or coal cellars, &c; the overcrowding and dirty habits of the people; unwashed bedding; stuffing up all the cracks to keep out the cold in winter; keeping filthy slops in the room for days; burning all kinds of rubbish got from dust yards, &c.; washing very dirty clothes in very little water, and then using the water to wash the floors and stairs. I give you but one case showing the results of the above. At 24, Charles Street, there were four families in as many rooms. The man in the front parlour used to buy the insides of dead horses, raw, and cook them in his room. To make matters worse, he had a sick wife and two boys in this one room. The fever broke out, and in a few days eleven persons were carried away, four of them to die, and amongst them the cats'-meat man and his wife. The house was shut up for some weeks, after which the landlord wanted some men to go in and clean it out. They refused, and after a little jeering, and drinking a good deal of brandy, he went in himself. He was dead in less than twenty-four hours; but his evidence lives to prove the truth of the above statement."

And now with a renewed confession of our faith in the soundness of all the resolutions passed at the Conference at the Mansion House, which we also commend to the attention of the Royal Commissioners, we conclude by reminding them that we advocate the cause of the absent—of those who are "out of sight" and too often "out of mind:" of "the poor," who are made of the same "flesh and blood" as themselves, who must eat like themselves to live, and sleep like themselves in the same cubic feet of fresh air if they are to arise invigorated and not depressed; further, the cause of those to whom we owe all our comforts and luxuries in

life. For is it not the poor who unlade our ships, who make our streets, build our houses, construct our sewers, keep our own houses in a healthy, sanitary condition, and without whose daily menial service, life would be to all a perpetual toil and an unceasing degradation? To leave the poor in their present pit of physical squalor and moral corruption is to "take fire in our bosom" and to give an impulse to vice and immorality, which must eventually end in sapping the very foundations of our social and political fabric; while to lift them out of it, and to make decency and religion *possible* to them, is to show our discipleship with Him who came "not to be ministered unto, but to minister and to give His life a ransom for many."

DISCUSSION.

Dr. GODFREY was called upon to explain more in detail the objects of the Labourers' Dwellings Society. He said it was established for the purpose not only of improving the dwellings of the labouring classes, but to enable the labourer himself to buy his own house. This plan had long been formulated by the labouring classes themselves, their offices being in Metropolitan Buildings, New Broad Street, and the committee consisted of men belonging to the labouring class, as well as others, men of very large experience. The plan of the Society was the same as that proposed to be carried out, and already carried out successfully to a certain extent. This operation consisted in lending the labourer or artizan almost the value of his house. They first lent the labouring man the money to buy his house, and in that they differed from any freehold land society. The Freehold Land Society could not embrace people who had money; but that was not the class whom they were met to aid, but the poor labouring man, who had no capital at all. They wanted to hold out to

him a premium to be careful and industrious, so as to obtain his own house. Security was offered by a private gentleman, who came forward and said that he had not the money, but he had freehold ground rents, and was prepared to the amount of £50,000, to make a beginning, if Government would lend half of the money which the labourers had accumulated in the Savings' Banks, for which they paid 2½ per cent., and the Society would willingly give 3 per cent. for it, and deposit security. If he were asked what security they required from the working man, he simply said none at all. The only security was this, they charged the labourer only the same rent which he paid now.

A GENTLEMAN rose to order. He asked if this was the subject they met to discuss.

Dr. GODFREY said he understood they were met to discuss improving the dwellings of the labouring classes, but how could they improve a dwelling where there were six, seven and eight people in one room? It was impossible; they must erect new dwellings, and this was a plan by which new dwellings could be erected. He then repeated the figures he had given at yesterday's conference, and said the plan had already been tried in Wandsworth, and he did not think a better one could be formulated. He wished he had the power to explain it more fully, but would briefly say that the object was to enable the honest labouring man to put his finger into the money ring and to turn his industry to some account, the money paid being invested at compound interest, the tenants paying nothing beyond the usual rent would be able to possess their own houses in nine years.

Dr. ALFRED CARPENTER said one of the most important points to be considered was how to make the homes of the poor healthy, and it ought to be looked at from a practical point of view. Unfortunately the practical side of it bristled with difficulties in all directions. It was all very well to come forward and lay down some hard and fast line, and say that would do; those who were actually at work in the matter knew very well that it was not so.

The first difficulty was the antagonism which existed between local self-government and centralisation. It was evident there must be local self-government to do the local sanitary work, and there must also be a certain amount of centralisation—certain principles laid down, and those principles rather than details were the matters which should be brought before the House of Parliament. He thought it a great mistake to trust too much to detail in connection with sanitary work in legislation ; the great point was to get the people educated up to such a level that they might see themselves what work was necessary, and see that it was done, and there you had the antagonism between paternal government or centralisation and local self-government. These difficulties had been enhanced to a great degree by legislation. Those difficulties had been alluded to by Dr. Shirley Murphy, who pointed to the dangers which arose from too much paternal government. Many of these difficulties had been produced by legislation, and undoubtedly parliament must be appealed to to get them removed, and there again came in those exigencies of political life which prevented such arrangements being carried out. Three years ago he had the honour of sitting on a Royal Commission, and it was often said that a Royal Commission was simply a device of political parties for shelving unpleasant questions. That commission had to inquire into the question of infectious hospitals in connection with London. It sat for a very long time, and a great deal of evidence was produced, which showed the difficulties which existed in consequence of the legislation in connection with the repression of disease. Several recommendations, however, were formulated, the most important of which was the necessity of separating the sanitary work of the metropolis from that connected with destitution. At present the great point with guardians was to take care of the rates rather than to feed the poor, and in one respect that was quite right. If they were to open their arms, and give to everybody who came to them the poor rate would become something enormous, because benevolence tended itself to produce pauperism and increase

it. It was therefore necessary that the destitution authorities should not encourage that benevolent view. But it was very different when you came to deal with sanitary matters, and the commission recommended that the sanitary work which now devolved on the destitution authorities should now be carried out by the sanitary authority, where the question of whether a person was a pauper or not did not come to the front all, the simple question being the repression of disease. To take the analogy of fire, if a fire broke out there were means by which it could be put out immediately, and so prevent great destruction of property, but what would take place if the fire were allowed to get ahead whilst you gave notice to certain people in different parts of the district, and when you asked them to come and put out the fire were told that the fire must be allowed to burn until they had got authority from some office in Whitehall to attend to it. That was one of the great points which required the action of Parliament, and that could only be brought about by a healthy public opinion, whilst that in its turn would be produced by such meetings as that, if they could only keep the point before them and endeavour to get from Parliament what they wanted, independent altogether of political exigencies. As Mr. Murphy had plainly pointed out Belgravia could not be separated from Bethnal Green, they were all parts of one great body, and ought to be responsible to one another for their management. The arrangements of details ought to be left in the hands of the local authorities, Parliament simply laying down the principles upon which they should do their work. He believed that was all that Parliament could properly do, and that it would be a great mistake to call upon the Government to do everything. If the people would only determine to do it they would be more likely to succeed.

The Rev. J. H. I. HILLOCKS said it had been again and again suggested that the education of the people was the great means by which they must expect to aid the people, and he felt convinced that until they had won the hearts of

the people, and got the head of the people, it would be impossible to do all they wished for the benefit of the people. It was now nearly twenty-four years since he tried to do his best in this matter in London, and since then he had had a great deal of experience in regard to it. He was glad to see these conferences being held, because it was a sign that something was going to be done. The facts brought forward had surely been ghastly enough to produce a desire to help in every possible way, and to convince anyone that the present state of things was a disgrace to civilisation. The figures brought forward represented a certain amount of degradation and misery, but the sufferings which lay behind it was impossible to detail. They required not only to know these things, but there must also be mind-work to think of the poor, heart-work to feel for the poor, and foot-work to go to the poor, and all this must spring from compassion towards them.

The Rev. G. M. MURPHY said he would simply offer one or two suggestions; one was that the Mansion House Society should as speedily as possible call a conference of *bonâ fide* working men, and hear what they had to say themselves. From what had been said to-day, some persons must think there had never been a Building Society in the whole of London managed by working men, but he happened to know that there were very many. There were one or two things which manifestly ought to be recommended, one was an unification of the sanitary laws, and if what was said by Dr. Murphy was right, the sooner those laws were rectified and simplified the better. He had just read the description of the proceedings to be gone through for removing a sick person from a densely crowded dwelling, and it appeared there were nine applications to nine different authorities before the poor person could be removed to a place of safety. There ought to be at least uniformity of authority, and then there should be simplicity and promptitude of action. He was pleased to hear that the Mansion House Committee took care when they received information that the informant should not get into

trouble thereby, and that was a very important matter, because the greatest sufferers from want of sanitation were often in dread of their landlords, and sometimes in fear of other persons. There was no hope for any real and permanent improvement of the working people unless to a large extent they did it themselves. If they could be got by any means to respect themselves and get something like self-control, then they would be at once on the highway to a true and lasting improvement. One other suggestion he would make would be that there should be in every borough a council of well-to-do people, not necessarily belonging to the neighbourhood, and of working-people, who should consider all these questions of sanitation, and the houses of the people, and all matters of general importance for the common good. It would be of inestimable advantage to hear men of intelligence talking over those matters which might be of service not only to the working classes, but to the whole community. Something had been done, not as much as might be, but there was no royal road in these matters; patience and intelligence was required; the School Board was doing a vast deal of good work in this direction, and hundreds of thousands of children were now growing up into men and women better educated than their parents, and therefore in the next generation they might expect to see a great improvement. In conclusion he would repeat the suggestion he first made, that a conference should be called, not of people speaking on behalf of working men, but of working men themselves.

Mr. HUNTER said he was a working man, and a very general feeling amongst them was that they wanted the help and sympathy of those well to do, but did not want to be treated as mere machines; in fact, intelligent working people would not be treated in that way. With reference to the question of building societies which had been mooted, he must say that a great many working men knew all about that question, and did not want anyone to tell them how to manage them; they had done it for themselves.

The Rev. SEPTIMUS BUSS said the evils they wished to remedy were undoubted, and he need not allude to them specifically. He thought the subject might be divided into two parts, first, the sanitary condition of the houses, and next the building of houses for the people. With regard to the sanitary condition of houses, it had been shown by Mr. Arnold Foster that the law already gave sufficient powers to the local authorities. He would suggest that the Artizans Dwellings Act, the Nuisances Removals Act, and other Acts of a similar character—if Parliament would only find time to do something practical—might be consolidated and amended. With regard to the building of houses, he would suggest that it be entrusted to some new Department of the State. The Post Office was a State Department which managed the carriage and delivery of letters, and it not only did the business well, but carried its own profit. He was disposed to think that if a new Department were set on foot it would be able to build houses for the people, and make it not a source of profit, which would not be desirable, but at any rate be self-supporting.

Mr. HARRISON said it had been his privilege for a number of years to be thrown amongst the very poor who lived in the slums of this vast city. Having listened to the papers which had been read, he thought there had not been that provision made for the very poorest people which seemed to him necessary in this great movement. In such neighbourhoods as Seven Dials, St. Giles', the New Cut, and all about the East End, there were large numbers of persons who belonged to this very lowest class, and unless they were provided for they would continue to be a source of danger; they were the persons who could scarcely keep body and soul together by their earnings, and he had not heard of any scheme which appeared to make provision for them. They were the class who were just one step above pauperism, and they formed a large class; people who strove honestly to get a living, and he thought they should have some place in these building

schemes. In the neighbourhood of Newport Market a large number of these people formerly lived, but this large site had been cleared and a number of buildings had been put up at such an enormous rental that it was impossible for these poor people to pay the rents. The rents varied from *7s. 6d.* to 13*s.* and 13*s. 6d.* a-week, and he found on inquiry that not a person lived in them who formerly resided on the spot; they were driven into Drury Lane, Seven Dials, and other neighbourhoods, where the overcrowding became worse and worse, so much so that the other day when a fire occurred, from one house seventy-three men, women and children were driven out at about three hours' notice. Was there no means by which some provision could be made for the poor coster, pedlar, needle-woman, the poor widow with her family, and such persons? The intelligent artizans were able to take care of themselves, but it was the poor and helpless who wanted homes provided for them.

Mr. BLOOMFIELD wished to controvert some of the views put forward in the last paper. There was no doubt the London poor were in a very sad state, and the question was one of great difficulty, and amongst those difficulties was the coming in from the country of a number of men who added to the misery which at present existed, but it was thoroughly impracticable to try to load the landlords of this country with the whole of the obloquy. It was his privilege to have given evidence before the Royal Commission on technical education, and on reading the report he had seen what had occurred on the Continent in reference to this matter, and he believed if that were more attended to there would be an opportunity of keeping people in the country in a practical and proper manner. As to sending 1000 people into the country and planting them on the land without one fraction in their pockets, and nothing in their hands but a spade to work with, it was simply drawing a red herring across the path of this great movement.

The Rev. G. W. MCCREE thought one of the first things to be done was to vindicate the independence of sanitary

inspectors. If an inspector were willing to do his duty he had immense difficulties in his way: and unless he were made more independent of local vestries there would never be much improvement in the condition of the poor. On one vestry in the centre of London there were 16 house farmers and 16 publicans, which was exactly 16 of each sort too many. The house farmer and publican ought not to be the superiors of a sanitary inspector, and should have no power to remove him because he did his duty. There were sanitary inspectors who dared not report on unsanitary neighbourhoods, because they knew they would lose their position if they did so. Again, in Queen's Buildings, Southwark Bridge Road, which were said to contain all modern improvements, there were families living beneath the surface of the ground, which he considered decidedly improper. Another objectionable feature in these buildings was the enormous height at which some of them were built, which must be a serious source of discomfort to the inhabitants, especially to the women who were having families.

The CHAIRMAN said the time was drawing near to close the discussion, and more than one of his kind neighbours wished him to say a few words in conclusion, and he hoped it would fall to his lot to be a peace-maker. There had been some little warmth of feeling and strength of expression during the meeting, but he was Englishman enough to say he was glad of it. He liked hard knocks, even when he received them, though he was afraid he tried to give them back again, but he always made it a rule to shake hands afterwards, and he generally found that those who did so were better friends than they were before. A plan had been laid before them by Dr. Godfrey, by which labouring men might become landlords of their own dwellings; to that two objections had been made; one, that perhaps he was speaking somewhat on behalf of his own house, like Cicero, and the other, that his scheme wanted the basis of security. Now he begged to say that he had had before him the scheme of the labourers dwellings in Leeds which was of the same kind, and had been in operation for

about forty years, and it had created no less than 7,000 freehold houses, which were held at this time by working men. He could not quite say that he had mastered Dr. Godfrey's scheme, because the figures laid before him were very slight, but they were entirely on the lines of the Leeds society, which was the most solid and efficient in the country. He believed, therefore, the suggestion had in it a great deal of reason, and deserved to be sifted ; and when he saw a large number of working men anxious to unite and become freeholders of their own dwellings through that Society, he could but desire to encourage it as far as possible. Another speaker had referred to great block buildings erected during the last few years, and he could confirm the very sad fact with respect to them, and the clearances which had taken place in London. The working classes might be divided into artizans and labourers, and the artizans again into skilled and half-skilled. These great blocks had up to this time only housed the skilled artisans, and he might add that they had housed clerks in commercial houses in the city, but they had failed altogether to reach the poor, or, as he would rather call them, working-men families. It was no dishonour for a working-man to be poor, he was not a pauper. Pauperism was a corruption of poverty, but the working-men were not paupers ; but hitherto all these vast magnificent structures had not housed the poor working-man, the rents being entirely beyond his power to pay. There was but one house he knew of, and that was on the other side of the Thames, in which the rooms had been so laid out, and the rent so arranged that a poor working-man could enter it. He inquired of the manager the other day whether a tenant was ever refused because he had an enormous family, and was informed that he never was, and that the wish of the managers was to get to the lowest grade, and meet the needs of the poorest. This was a subject which needed a great deal of expression, because, as Dr. Carpenter had said, it bristled with difficulties. Having attended to it for a long time past to the utmost of his power, he could say

that the more he studied it as a question of practice, the more he found himself met all round by difficulties which he would not say were insuperable, because they must be overcome, but they were so great that at the present moment almost all action seemed to be checked. He had heard a good deal that afternoon with which he heartily agreed. He quite agreed with Dr. Carpenter about paternal government, a description of which he read a short time ago which seemed to be exactly true—viz., that it made people go to bed at ten who wished to sit up till eleven. That was the most abominable kind of government in the world, a kind of police government under which no individual could have freedom for his own personal life. And he hoped the day would never come when the Legislature of England would touch the personal liberty of the people so as to make them go to bed when the House of Commons pleased. He also agreed that many who were looking to the Legislature and to the Government to come in and do great things, were turning away from their own responsibilty, because they were determined to do nothing—those who would do nothing—and invoked Jupiter and all the Gods. For his part, he wished to renounce all those deities, and do what the poor waggoner in the fable did, after he had cried and torn his hair, he got up and put his shoulder to the wheel, and got his waggon out of the rut. That was one good feature about the society connected with the Mansion-house, it depended upon the voluntary action of men and women who did not work in that eleemosynary manner which had the effect of paralysing the action of other people, but with kindness and self-denial used their best efforts to persuade and educate the people up to the pitch of understanding what was necessary for the sanitary condition of their homes. It was the combination of those two things to which he mainly looked—the commonwealth doing that which nobody could do, for there were things which no individual and no combination of individuals could do. But what was the commonwealth? It was the collective prudence and collective power of men

that formed a human political society, or commonwealth; and there were things which could only be done by the collective prudence and power of the whole commonwealth; but under that ought to come the great element of local self-government, making every borough, every board, every vestry, every parish, and every man do his duty. That seemed to be the real cure, and if they could only press onward in that direction all these difficulties would be surmounted. It had been said that there were laws on the statute books at this moment which would meet almost every one of the existing evils. Such acts as Lord Shaftesbury's in 1850, Mr. Torrens', Sir Richard Cross's, and a number of others, provided legal powers so great and far reaching that they were like the machinery in some of the annexes of the Exhibition, a mechanism fit for everything,—but one thing was wanted, the dynamic power to put them in motion. Unless there were adequate dynamic force, which could expeditiously, directly and with effect, be brought to bear, they would be as they were at present, baffled by the interest of those who held houses, by the inertness of those who ought to set the law in force. As one of the speakers had said, Royal Commissions were very often shelves, but he hoped that the present Royal Commission would not prove to be so. He could answer for those who sat around that Board, that so far as their will went it should not be so; but at that same time he must say fairly, that it would not depend on the Royal Commission entirely. The commission might draw up a report which would satisfy all the contending parties in the room, but unless it were carried into effect, it might be like that of many other reports—like that of two years ago—which even now had not taken effect; and even if there were further legislative powers provided, the work would not be done if the public zeal slackened. It all depended on the public opinion of this country, on the efforts of those who had the heads and hearts to care for the condition of the poor. During the last six months their consciousness of this intolerable evil had been aroused, and he believed that there

would be found that dynamic force which would put the statutes in operation, and that gradually and with patience —with which alone human affairs could be governed— means would be found for fully and completely remedying the sufferings of our population.

The REV. MARK WILKS then proposed a vote of thanks to his Eminence Cardinal Manning for presiding, and above all for the very practical words with which he had summed up the results of the conference.

The motion was seconded by Mr. John Hamer, the Hon. Sec., and carried unanimously.

The following paper, by Mr. Lewis W. Leeds, an eminent American expert, was prepared but not read for want of time :—

HOW TO REBUILD LONDON.—There is nothing more English perhaps than London. The strong individuality of character is here clearly marked in bricks and mortar. The practical common sense of the *individual* Englishman is here clearly shown. We find each man, with his brick-and-mortar, building a house just to suit himself. Some are very handsome; many are very ugly. Most of them honestly answer the purpose for which they were intended. An Englishman's home is a synonym for personal comfort the world over; and you find in England the most delightful homes in the world.

But this strong individuality of character makes a very poor city. A city is not the dwelling-place of a single individual; it is the home of a great mass of people. It requires the sacrifice of a great deal of individuality to make one perfect and harmonious city. But Englishmen don't like compromises. I don't think it was ever intended that Englishmen should live in cities. The arrangement of this great mass of houses we find around us, and what the foreigner instinctively calls the "City of London," shows clearly enough the Englishman himself never in-

tended that he should live in a city, and the very thought is to-day abhorrent to a large portion of them. It is very annoying to a resident of South Kensington to speak about South Kensington as being in the City; and to speak to a St. Swithin's Laner about the City when you mean Hampstead Heath, is an unpardonable offence. But here you have gone on building your individual houses, and around these others have builded till they formed villages, and these villages have increased to cities, and these cities have increased until they press each other on every side, and in their great struggle for individual existence they are crowding down and crushing to death thousands and tens of thousands of the weaker citizens, who are unable to hold their own against the struggle for individual right of their stronger neighbours.

This condition you now admit to be very unsatisfactory. And now, as the Yankee would say, what are you going to do about it? Can you subordinate the English in you sufficiently to compromise your special individual rights and privileges so as to form one united and harmonious whole? Or, would you prefer having a foreigner, one who has been pressed on all sides, and moulded into a regular machine citizen, to come and propose the necessary compromises for you?

Paris has been remodelled in a grand and arbitrary way. But here all the individuality is thoroughly crushed out. Her grand boulevards are as perfect and as uniform as a regiment of soldiers. They are very interesting as one great whole, but are very monotonous and uninteresting to examine individually. I hope London may never be obliged to submit to a wholesale crushing of the individual characteristics of her citizens to this extent. It is not necessary.

It is not impossible to make a perfect city—and as large as you please—and every house in that city may be a healthy and comfortable home. And there was never a better opportunity, there was never a better ground work

for making one grand model city than is now presented, by uniting into one the great mass of towns surrounding the City of London.

By the thorough and intelligent agitation of the whole subject by a series of meetings like these—the good practical common sense of the people will get at the best way of making the necessary personal sacrifices—and I have full faith in the genuine liberality of the English people in making these individual sacrifices when they are thoroughly convinced that the good of the whole demands it.

The Englishman is a splendid city builder when he undertakes to do that specific thing. Over two hundred years ago, an Englishman and a Londoner, sat down in this place and planned a city to be built on his estates in the wilderness of America. The trees were hewn down, and the virgin soil of the wilderness was formed into streets, the names of these streets were placed on the map before it left this country. That city was built, and those streets extended, and now, after two hundred years, nearly one million of the best housed people in the world feel the most profound veneration for that great noble and intelligent Londoner. Those plans were made with such intelligence and forethought that scarcely a shilling has been spent in their modification.

While Philadelphia bears such splendid testimony to the genius of the Londoner as a city builder, the neighbouring city of New York shows the strong contrast of the Continental method of building. In Philadelphia each man, even the mechanic or labourer, owns his own house. In New York, one half the population are content to pay an enormous price for one, two, or three rooms in one great building, and all with one common stairway. And many other of the special privileges of a home which an Englishman so highly prizes are too often held in common.

Probably the greatest question the citizens of a united London will have to deal with will be the means of communication. Steam has so completely superseded all

other means of communication that it must be considered the power on which we must depend for the future transport of the people. Great strides have been made within a few years in the introduction of steam railways in the various towns around London. But the want of co-operation is strongly felt here too. Nothing could be finer than the magnificent service on the Great Northern, or the Southern lines, the Great Eastern or Great Western Railways. The one million of people living in either quarter of the city are well accommodated by each one of these roads. But the unfortunate traveller that wants to go from the north to the south finds to his horror that the old privilege of the farmer of keeping his gates shut across his lanes, to prevent the trespass of cattle on his farm, is still maintained. And the labouring man, who might have his cottage in the north, even should his employment occasionally be in the south, is prevented from doing so now by the enormously unnecessary sacrifice of time and money which he is obliged to make now for the want of proper communication between the great distributing lines.

Much stress is laid upon the fact of the frequent movings of the tenants. I have inquired a little into this. The mechanics, those engaged especially in the building trade, are frequently employed one month in the east, and, perhaps, the next month in the extreme west. They tell me they cannot spare the time, neither can they afford the money necessary for this long travel, and they often find it better to rent rooms and move their family from place to place rather than to be obliged to go themselves every morning and night. This could be greatly obviated by the proper connecting together, and the harmonious working, of all the railways as one grand whole. I believe it is quite possible, with the energy and ingenuity which may be brought to bear upon this subject, to so perfect and complete the communication between the great systems that have been already constructed, that the mechanic or the merchant may own his own house in one of the

delightful suburbs of London, and get conveniently and readily to any other portion for business or pleasure.

Around this as the great basis and groundwork, we may exert our energies, and every individual can help to purify each house or each room, and with a united and well-directed purpose we shall see a united London, the largest, the wealthiest, and a city of the most delightful homes of which the world can boast.

THE

SANITARY CONSTRUCTION OF HOUSES.

CONFERENCES OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS ON THURSDAY, FRIDAY, and SATURDAY, JULY 10th, 11th, and 12th, 1884.

INTRODUCTORY PAPER.

THE SANITARY ARRANGEMENT OF HOUSES IN LONDON DURING THE LAST ONE HUNDRED AND TWENTY YEARS.

DRAINAGE UNDER DWELLINGS.

DISPOSAL OF THE SEWAGE OF A DWELLING-HOUSE WITH NO MAIN SEWER OR OUTFALL.

IMPERMEABLE CONSTRUCTION OF ROOFS, WALLS, ETC.

THE CONSTRUCTION OF DWELLINGS.

SUGGESTIONS RESPECTING DOORS AND FIRE-RESISTING CONSTRUCTION.

SANITARY ASPECTS OF INTERNAL FITTINGS.

HYGIENIC VALUE OF COLOUR IN THE DWELLING.

WATER SUPPLY. CONCLUDING PAPER.

VOL. II.—II. C.

THE SANITARY CONSTRUCTION OF HOUSES.

CONFERENCE ON THURSDAY, JULY 10, 1884.

1. "*Introductory Paper.*" By Professor T. ROGER SMITH.
2. "*The Sanitary Arrangement of Houses in London during the last 120 Years.*" By FRED W. HUNT.
3. "*Drainage under Dwellings.*" By S. FLINT CLARKSON.
4. "*A Short Description of a Mode of Disposal of the Sewage of a Dwelling-house situated in a locality where there is no Main Sewer or Outfall.*" By THOS. WORTHINGTON.

A CONFERENCE on this subject, convened by the Royal Institute of British Architects, commenced its sittings on July the 10th, Mr. Ewan Christian, President of the Institute, in the Chair.

The CHAIRMAN, in opening the proceedings, said they had met to discuss a very important subject, one which affected everyone, and one which was eminently practical if properly treated, and from that point of view he hoped it would be considered. He must say, in the first place, that the Institute did not hold itself responsible for the opinions which might be given by any individual speaker. He should say, also, that the question was not one for the rich so much as for the great multitude of the middle and the working classes. When he looked round and saw what

provision was made for the middle class as well as for the poor, it often made his heart fail within him to think of the miseries the people who would have to live in the houses in the neighbourhood of London, and of most great cities, would be called upon to endure. The rich, of course, could take care of themselves; they could employ architects and specialists to advise them, and could carry out their wishes without any stint as to cost; but the generality of the people had to live in houses in which sufficient care had not been taken, owing to lack of means to do so. Amongst builders there were, of course, good men as well as bad, and therefore he should not denounce them altogether. There were many who built thoroughly well, and there were many who built simply to sell, not for the benefit of the buyers, but for the immediate prospect of gain. As to the general question of house building, one of the most important points undoubtedly was the site. Some people supposed that when a builder told them that a house was on a gravelly soil and dry underneath, there was no occasion for further care, because the house must be dry and others had a great dread of clay soils. But in the neighbourhood of London, over a large area, people were obliged to live on clay soils, and how to meet that difficulty was the business of the architect, and ought to be the business of the builder as well. On one occasion, when he pointed out how a house could be made perfectly damp proof, the builder replied that the work would not be seen, and therefore would not be paid for; and it was no use doing it as it would be a dead loss. He feared that sort of idea was too prevalent. He believed architects, in laying out estates for building, did not pay sufficient attention to the subject of aspects, for if there was one friend they ought to welcome in a house more than another it was the sun. There could not be a wholesome house in which the sun did not penetrate. It might be perfectly dry, but if the sun did not come in to cheer you in the winter months, you never could have a comfortable home. He had seen many instances where this matter had been entirely ignored.

It was sometimes said it was impossible to get sunlight in certain situations, but he did not believe it. He never found one in which he could not get the sun in by proper arrangement, and it was an architect's business to contend with difficulties and overcome them. If they could not get the sun in directly they might make traps to catch sunbeams. With regard to sites, of course people living in the neighbourhood of large towns could not command them because the requirements of business necessitated their living in certain quarters ; but they should always bear in mind, when looking for a house, Lord Bacon's aphorism, "He that buildeth a house on an ill seat committeth himself to prison." The same applied to the man who bought or rented a house, and every tenant should very carefully consider this matter of sunlight as of first importance. As to soils, there was no doubt in his mind that a dry gravelly subsoil was of the utmost importance as affecting the general quality of the air. Any persons who had particularly observed the different qualities of light in different parts of England, must have noticed the extraordinary difference there was in the light under similar circumstances. If they travelled through Staffordshire they would rarely see a thoroughly bright sky, and he was not merely referring to the coal districts but to the general lie of the country. The same might be said of a great part of Gloucestershire and other parts of England, and you would see exactly the contrary in those parts of the country where the subsoil was thoroughly dry. In the West of Norfolk, where the Prince of Wales had his estate, you would find almost all through the year a bright sky, and that, he took, was owing in great measure to the beautiful subsoil—a dry light sand —which existed there. Many years ago he had travelled from the North of England direct to the South, starting from Westmoreland on a bright day, and ending in Sussex on a similar day, but he noticed the sky was very different. In the one part there was a clear cool light from over the mountain limestone, but over the sandstone of South Sussex there was a rich warmth of colour very beautiful to look on.

With regard to houses themselves, all these difficulties about the subsoil had to be met and overcome by the architect, and he ought to get the sunshine into the house somehow or other. When you came to the interior, one of the principal points which concerned health, perhaps more than anything else, was providing not only a sufficiency of air but a sufficiency of light. This was very much ignored by many builders who simply built to sell; they thought they would make the houses look pretty by putting in some obscure glass on the tops of the windows, not making them to open, and shutting out the light, and thereby depriving the inhabitants of what was most valuable to them. If they looked at the faces of children brought up in dark rooms and then at those of children brought up in light rooms, the wonderful effect of light upon them would be noticed. Those brought up in the dark would have pale sickly faces, while those brought up in the light would be bright cheerful faces. It was supposed that English children could not live in India, but he had tried his theory of light in that case, and having made special enquiries on the subject, he found that when light was freely admitted to children, they could live there as well as in England. But, after all, when a house was finished, and people bought it and went to live in it, if there was not common sense inside, all that the architect and builder might do to make that house comfortable and right, as far as health principles were concerned, might be entirely spoilt by the way in which it was treated. If, for instance, the architect had provided for admitting all the sunlight possible, and then the lady of the house covered the windows up with blinds and curtains, what was the use? The rooms became gloomy and dark. The same with regard to ventilation, all the efforts of the architect would fail unless common sense was brought to bear on the use of the means provided.

INTRODUCTORY PAPER.

By Professor T. ROGER SMITH.

THE health of man is greatly influenced by his food, dress, climate, occupations, and dwelling. It is with the conditions affecting the last of these, as they occur in our own country, that we are at present concerned.

There are few subjects which are really new, and certainly human dwellings must be nearly as old as the human race. It seems, therefore, reasonable in approaching a consideration of them to cast a glance backwards, and try to see how our forefathers have been housed.

The earliest habitations, of which traces remain in England, can have afforded little more than a bare shelter from the storm, and some degree of warmth. Yet even those primitive huts, the remains of which are found on Dartmoor and elsewhere, must at least have protected their inmates against the worst vicissitudes of the fickle English climate.

It was a fortunate circumstance for ancient Britain that a Roman occupation took place. At such a spot as Silchester you will see the remains of a town regularly planned, and of many buildings of some solidity, decency, and order. What existed at Silchester was repeated in various forms throughout our country, as for example at Colchester, Dorchester, Uriconium. Good methods of building, and an orderly mode of laying out dwellings, were thus introduced, and to a certain extent took root in the soil.

Every glimpse that we can get of the mode of life of the Saxons, when they became able to attend to the arts of peace, seems to shew a largeness of ideas, and an orderly spirit, no doubt greatly due to these Roman traditions and remains. We have proofs, for example, that the Confessor's Monastery at Westminster was planned on the most liberal

scale, and very carefully constructed, and so probably were the best Saxon dwelling-houses.

The Norman conquest covered our land with castles and keeps, in the ruins of which good internal arrangements are still to be detected. Such a structure, for example, as the White Tower of the Tower of London, when not overcrowded, must have been an excellent residence before it became a prison. It is probable, however, that ordinary dwelling-houses, small and large, deteriorated at this time in consequence of the occupation of the land by strange masters, who felt little interest in the Saxon peasantry.

Of English residences built during the Middle Ages, remains have come down to us only from the most strongly built —chiefly the castles. But from the best preserved and most complete of these, as for example Conway Castle, we may learn that the elementary principles of sanitation were understood, and pains and care taken to secure comfort and even luxury, so far as they can be enjoyed within the restricted boundaries of a fortified dwelling; while the semi-fortified houses, of which a few remain in tolerable preservation, such as Penshurst, Ightham, Warwick Castle, and Haddon Hall, were many of them so complete that they continue habitable even by this fastidious generation.

Monastic buildings, from a time long before the Conquest down to the Reformation, afforded a series of admirably well-planned and well-built dwellings, for the residence in common of a large number of inmates, the general idea of which survives in the colleges of Oxford and Cambridge. The neighbouring detached but dependent buildings, such as the abbot's house, the mill, and the grange belonging to a monastery, were each and all of them good specimens of small dwelling-houses. They were, however, in all probability, far better than the houses which surrounded them, if we may credit a curious but by no means flattering account of the ordinary English dwelling-house at the close of the Middle Ages which has been lately made public in Brewer's 'Henry VIII.,' and from which I cannot

resist the temptation to quote a few lines. It is from the pen of the most accomplished scholar and cleverest man of letters of the time.

Erasmus, writing to Wolsey's physician on the dwelling-houses of England in the early years of the reign of Henry VIII., says: "First of all, Englishmen never consider the aspect of their doors and windows; next, their chambers are built in such a way as to admit of no ventilation. Then a great part of the walls of the house is occupied with glass casements, which admit light but exclude the air, and yet they let in the draft through holes and corners. The floors are in general laid with white clay and are covered with rushes, occasionally removed, but so imperfectly that the bottom layer is left undisturbed sometimes for twenty years, harbouring abominations not to be mentioned. * * I am confident the island would be much more salubrious if the use of rushes were abandoned, and if the rooms were to be built in such a way as to be exposed to the sky on two or three sides; and all the windows so built as to be opened or closed at once, and so completely closed as not to admit the foul air through chinks, for as it is beneficial to health to admit the air, so is it equally beneficial at times to exclude it."

After the time of the confiscation of Church property, under Henry VIII., a large amount of house-building on a great scale occurred. The vast Elizabethan and Jacobean mansions, of which we are justly proud; and the smaller manor-houses, farm-houses, and town-houses which were erected at that period, and of which many specimens remain, show a great advance in the art of architecture, and are even now delightful residences.

It is very doubtful whether the influence of Italian and French examples in the seventeenth and eighteenth centuries was not on the whole disadvantageous. Certainly some of the Palladian mansions of about a hundred years ago are less carefully disposed for health, decency, and comfort than the Elizabethan ones which preceded them. The story of what followed, at any rate in the Metropolis,

will be told us in the paper set down for reading immediately after this, so here my retrospect may well close.

We now live in the era of the steam-engine and the railway. An unparalleled revolution, within the lifetime of many of us here present, has changed the social aspect of the country, and has altered the conditions under which our dwelling-houses, especially those in our towns, are built to a remarkable extent.

A teeming population of operatives, constantly on the increase, has to be housed somehow; and an enormous number of persons in the middle and higher classes desire, and are able to afford themselves, accommodation of a superior, and in many cases a luxurious kind. A vast section of our people live in Institutions of some sort. The inhabitants of our hospitals, asylums, prisons, workhouses, schools, and almshouses, if all reckoned up, would amount to an astonishing total, and are on the whole well cared for; but scattered over the face of the land our agricultural and mining populations, less affected than the inhabitants of towns by the recent changes, have in many cases to occupy dwellings identical with, or very similar to those of three or four or more generations back.

It is with this state of things that we have to do at the present day.

If we try to form an estimate of our actual condition, it will soon become clear that, with our present habits of life, the influence of the dwelling on the health of its inmates is very great. I am inclined to believe that it is much greater than at any previous period. Indoor occupations for men are far more common than they used to be, and though women have to a large extent lived in the house for several centuries they probably now do so more than ever.

The habits of luxury which increasing wealth brings with it all tend to weaken, or at any rate to refine, our physical organisations, and so render us more and more susceptible to the influences of the material circumstances which immediately surround us. This being the case, it

becomes increasingly important that every means should be taken to render dwelling-houses thoroughly healthy.

In one respect the habits of modern life, and the plentiful supply of one of its first necessaries, have introduced a very serious danger, the nature and extent of which are happily at last tolerably well known, so that preventive measures can be applied. I allude to the use of water as the vehicle for removing refuse matter from our houses. So many persons imagine that sanitation only means drainage, that I should have liked to pass by the subject entirely, if only to show that other functions of a dwelling as well as the disposal of its sewage are of importance to health. It seemed, however, impossible to avoid this allusion to it. We had unconsciously exposed ourselves to the poison of sewer-gas, and we now find that we must fight tooth and nail to put an end to that danger.

Much else is indeed involved in the conditions of healthy dwellings besides drainage, and to much of this the attention of this Conference will be directed by the papers about to be read and discussed.

Good disposition of the houses in a town, a street, or even a small group, so as to secure the best aspects, and the largest amount of sunshine, air, and clear space, is a matter of primary importance, the more so because pecuniary interests often appear adverse to the best sanitary conditions. Good disposition of the plan of the dwelling itself is of the utmost importance from a sanitary point of view; but its value is, I think, more recognised by the public, and even by speculative builders, than the importance of healthy laying out of sites for houses.

Adequate ventilation, including methods for the removal of vitiated air from gas burnt in our dwellings; sufficient means of warming; ample windows, properly placed to light the whole of each room; sound construction, so as not only to make the dwelling durable, but to protect the inmates from the effect of inclement weather, especially of cold and of damp, those greatest enemies to health and comfort in this country; protection from noxious com-

pounds in the paint or paperhangings used for the dwelling; complete systems of drainage and of ventilation for the drains; and an ample supply of pure water, hot and cold—are among the obvious features of house sanitation. Other less obvious matters remain. The influence of monotony, of insufficient light, of dullness, is known and felt by us all as depressing, or in other words as unhealthy; and the designer of a dwelling which is to be fit to be a home should have in his mind the necessity for its being pleasant quite as distinctly as the more obvious questions of where to put his drains, or cisterns, or stoves.

I propose to conclude by directing your attention for a moment to a consideration with regard to which something may be said, without, I hope, anticipating what we are to hear from others. I refer to the share which *the architect* may properly claim in the duty and privilege of promoting public health by improving the construction of dwellings. In other words, I propose to ask how far all this is an architect's question.

It is not sufficiently known to the general public, but well known to ourselves, that the actual direct control possessed by architects over the majority of the dwelling houses built in England is extremely small. When Prince Albert wanted to improve Buckingham Palace he sent for Thomas Cubitt, builder, and contrived it with him without professional advice; and this is the kind of thing which has been done by other persons less highly placed since then. In ninety-nine cases out of a hundred, the dweller in or near one of our towns, especially this Metropolis, never dreams of building his own house, and looks out for one ready built by a speculator, and puts up with untold inconveniences and even dangers from its many defects. But notwithstanding all this, the opportunities which we possess of influencing the buildings of this country are very great; they are such as no other body of men enjoys. We can do a great deal to secure that the homes of England are healthy; and if we fail to do all that we can, we shall be failing in a great public duty.

In the first place, I think it may be safely affirmed that whatever may be the case in towns, the country house of a person of influence and importance is now never built without an architect. From parsonage houses upwards we have the designing and superintendence of all the houses of the clergy in their parishes, and the rich when they are living on the estates. These then, we can make as fit to promote health and to avert disease as we are able, and they ought to be as healthy as any buildings can be. Collectively they provide for a vast number of residents, including a great proportion of the most important men and women of the country; and in addition to this, they are conspicuous as models. The dwellings of the highly-placed should be perfect, not only for their own sake, but because such buildings are sure to be imitated, and because their owners are most likely to promote sanitation when their own dwellings teach them what it means. What persons of power and influence do others in lower positions in life will endeavour also to do, and what they recommend will be likely to be followed. In not a few cases such persons are themselves builders of labourers' dwellings, while among them are some whose estates, situated in London, are each of them equal to a populous city, within which the owner of the soil has it in his power to prescribe any conditions he pleases to the persons who build or rebuild houses.

Next perhaps in importance from our present point of view are our countless residential institutions, if that term may be used to denote public buildings where persons live temporarily or otherwise. Every college, school, hospital, workhouse, &c., has its architect, and we have even seen military barracks erected by civil architects. The very purpose of these buildings renders attention to their sanitation one of the most positive duties of the architect.

At the other end of the scale the very numerous model dwellings erected in London and other cities for the urban labouring population, and the best agricultural labourers' dwellings are almost always put into the hands of architects,

and are buildings in which sanitary excellence is often the only good quality that the architect has an opportunity to impart. Between these two extremes lie the numerous dwellings of the middle class, which, as has been said, are far less under an architect's control than the buildings above or below them; yet it must not be forgotten that from time to time an individual house is commissioned, and ought to become a model. Some of the more intelligent of the building speculators are occasionally wise enough to employ an architect of skill and repute and to build from his designs, though hardly perhaps under his direction. In all such cases the architect should be sure that not only the ordinary appliances of sanitation, but, as far as possible, all the finer elements of a healthy dwelling, are present in his design, and should try to secure that they are retained when it is carried into execution.

Even in the case of the vast melancholy multitude of ordinary dwellings built by speculators on leasehold ground, there is one period in their history when an architect exercises some considerable control, and when, if he is thoroughly familiar with what makes houses healthy, he may prescribe and enforce building conditions that shall greatly benefit future occupiers. But nothing will effect a great improvement in these dwellings except a radical change in public opinion and feeling on the subject, and it may be hoped that such a Health Exhibition as this will tend to foster such an instructed public opinion.

It will, I trust, be conceded that the health of the community is one of the most important elements of its well-doing, and further that the dwelling may very largely impair or improve that health according as it is bad or good. I trust I have shown sufficient reasons for our recognising that this is pre-eminently an architect's question, and, if that be admitted to be the case, it will hardly be necessary for me to bespeak your best attention to those of our professional brethren who are to address us on some of the details of the subject, and ask you to contribute to its elucidation by joining with spirit in the discussions.

THE SANITARY ARRANGEMENT OF HOUSES IN LONDON DURING THE LAST ONE HUNDRED AND TWENTY YEARS.

By FRED. W. HUNT.

THIS subject is one that may be dwelt upon in detail, or by sections, to an extent sufficient to occupy the undivided attention of to-day's meeting, or of several meetings. In the short time, therefore, allotted to its consideration in the proceedings of to-day, I cannot do more than refer in general terms to some of the chief points that have occurred to me.

In speaking of the sanitary arrangements of houses in London during the past 120 years, the points that present themselves for especial consideration are—

1. Drainage and the appliances in connection with it.
2. Water service and its supply and arrangements.

But besides these, if time allowed, there are other subjects, as—

The general arrangement of the houses during that period,—and the use of the several parts, and their ventilation.

As to the question of drainage,—I must first make some allusion to the general drainage of the Metropolis; for the drainage of houses is dependent upon that of the town in which they are situated.

Before the commencement of this century there was not any system of public or general drainage existing. It is true there were both open and closed "*Sewers*" so called, but these had been provided for the purpose of carrying off surface water only, or for conducting fouled streams along their old courses. As new squares and streets were laid out and houses erected, sewers were formed under the new roadways, but these were still only for surface water, and it

was illegal before 1815 to conduct any fœcal matter into them. In the formation of these sewers, as they were only for surface water, the questions of a proper fall, or construction with a view to proper cleansing, do not seem to have been considered essential by the engineer or builder. When, after 1815, it was allowed to carry the overflows from cesspools and other foul drains of houses into sewers, the existing sewers, constructed for the purposes before mentioned, were used, and some have continued in use until the present time, being *sometimes* only elongated cesspools with the outfall higher than the upper end.

I should state that the sewers and drainage of the Metropolis had been under the care of the Commissioners of Sewers for the several districts for centuries, and they so continued until the Act of 1855, under which the Metropolitan Board of Works was formed. Since that time the general or main sewers have been vested in that Board, while others remain under the care of the several Parish or District Boards.

To come now to our question, which is house drainage. It was necessary, as will be readily seen, under the circumstances above alluded to, viz.,—when there were not any sewers for the reception of house drainage,—that each householder, large or small, had to provide for the reception and storage of all soil or refuse upon his own premises, until it could be removed with as little annoyance to himself or his neighbour as possible. The arrangements of houses therefore in the Metropolis differed but little from those in the country, with the exception that those in town had not the space or accommodation the country afforded for the conveniences required.

Much refuse that is now discharged into the drains was no doubt at first thrown into the streets, but as the regulations forbidding this were enforced, cesspools or cesspits were the means provided for the reception of all soil and sewage matter. These were usually constructed in the yards or gardens of the larger houses, which were provided with one or more privies, frequently arranged so that a

common cesspit would answer for them; while for poorer neighbourhoods and courts, one such convenience was provided, to be used in common by the residents of several houses. The cleansing of cesspools was done at night, and was an offensive work, attended with more annoyance than I need refer to.

House drains, similarly to sewers, were originally constructed to take the waste and surface water, and being for this purpose only, they were not very carefully laid, they were generally square in section, and they were frequently without any paved bottom. These drains were connected with the sewer if one existed within reach, otherwise they had to go to a cesspool. In houses built after, or only immediately preceding the commencement of this century, when the introduction of a water-closet into houses was becoming general, the drains were made of brick, circular in form, and such as are now called brick barrel drains. These drains were constructed with mortar as a rule, though sometimes a portion of the bottom was laid in cement, and they still discharged into cesspools from which overflows were carried to the sewer. No doubt the overflow was frequently connected with the public sewer, but it was not until 1815 that the penalty against such connection was removed. With a means of overflow and drainage, allowing as it did of the use of a greater quantity of water, and at the same time obviating the necessity for emptying cesspools so frequently, waterclosets instead of privies were generally provided for houses built at and after the commencement of this century, not only internally but externally. The difficulty that then presented itself to the builders was the keeping back of foul smells, and this was provided against by traps in soil pipes and dip traps at the bottom of pipes, frequently so large that they might be called cesspools.

Previous therefore to this century, and for the first quarter of this century, we find a gradual suppression of privies, and the introduction into houses of water-closets, with the old flat bottom drains retained in use, or such drains as had been

originally laid down, and these discharging into cesspools. It appears to have been considered that a drain would do for any purpose the needs of the occupier might require it to serve, and when all fœcal and offensive matter could be washed away out of sight, and traps were supplied or built to keep back offensive smells, it sufficed to allow this refuse and sewage to find a lodgment in cesspools under the floors of the house, or for that matter on the surface of the ground under the floors. When one cesspool became no longer serviceable, rather than cleanse it a new one was made, and the drain directed to it. The site selected for the new cesspool was one that was convenient for the drain rather than for the health of the house.

I have referred to this as the state of things existing for the first quarter or so of this century; I must rather refer to it as the state of things that came into existence then, and continued for many years afterwards. Subsequently, when sewers were allowed to receive all drainage and refuse from houses, cesspools were no longer constructed, but the old ones were only gradually disused, and a similar influence as before was still at work, for the old drains were retained and diverted only—the cesspools were not removed, they were only disused and left; in fact as little alteration or improvement was made as possible, and frequently that only by the order of the authorities.

About 1850, earthenware pipes came into use for drains, and these, with various improvements in their glazing and manufacture, are to the present time the most approved material used for house drains.

After the introduction of pipes for drainage purposes, the principles observed in the laying and construction of drains continued however to be much the same. The fall of the drains was not improved, and they were laid with very imperfect joints, sometimes not jointed at all—Dip-traps equal to cesspits were still built—Drains were brought into houses and rooms, and connections made there, and the offensiveness arising from the sewers and drains was still counteracted by traps and water-seals.

It was not until 1847 that compulsory powers were first granted to the Westminster Commissioners of Sewers, enabling them to require all houses to be properly drained into the public sewers, and privies and cesspools no longer constructed or used. These powers were subsequently granted to all the Commissioners and their successors, but the enforcement of these powers was very gradual and incomplete, as houses built before or in the beginning of this century are still to be met with which present examples more or less of combinations of all the systems named. Some with old flat bottomed or no bottomed drains still in use, others with very imperfect pipe-drains laid in the course of the old drains, and with large dip-traps, and water-closets without water laid to them, and with cesspools under the floors, not used perhaps, but that have never been cleansed or emptied.

Much has been done during the last few years in advancing sanitary knowledge, and I think I may summarise the principles gradually accepted, and now more generally acted upon as being—increased fall to drains—perfect water-tight joints—the abolition of dip-traps—keeping all drains outside the house—disconnecting them from the main sewers—the efficient cleansing of drains and the quick removal from them of all obnoxious matter—the separation of surface-water and sink and other wastes from soil drains—and a continual free current of air through the drains from near their entrance to the sewers along them and up the soil-pipes.

As to the Appliances.—One hundred and twenty years since, water-closets, as such, had scarcely been introduced, though water had been used as an agent for removal of soil for some accommodation other than commodes, and more private and convenient than outside privies, were demanded by those who could afford to pay for them and their fitting up.

The form of such closet at first in use was no more than a receptacle capable of being washed out, from which a pipe was carried to the drain, having a plug to close the upper

end, somewhat like a hopper-pan without a trap. This was fitted up in a cupboard or in a room, where convenient to the occupier, and provided with a seat. The demand for water-closets led to the improvement of the apparatus by various inventors.

Between 1770 and 1780 the first on record of several patents were taken out for an improved apparatus, the earliest of which were on the principle of a valve closet, but the kind of apparatus known as the pan closet, with a large container, came into use very generally later at the commencement of this century. The apparatus of each kind has been improved from time to time, and they have continued in use to the present time. The more modern apparatus is one entirely constructed in earthenware, some with a valve arrangement attached and some without.

The pipes from the apparatus to the drains have usually been made of lead. Other materials, such as earthenware pipes and iron pipes, have been used, but each of these were found to have faults greater than lead pipes. In order to keep back foul smells, D-traps, and traps of various kinds were introduced. These were formed in connection with the pipes, and a dip-trap was built at the bottom of the descending pipe. As offensive smells were more objected to, the traps were increased in number and size, but the acceptance of the principles now acted upon, and referred to above, has gradually led to the abandonment of the dip-traps at the bottom of the pipe altogether, and to constructing one trap in connection with the apparatus, as small as possible.

Wastes from Roofs, Sinks, &c.—The removal of water from roofs, and of surface-water, appears to have been quite natural at the first. It was conducted into the water-channels in the streets, or by drains, into the sewer under the street, and it was only after the discharge of the foul sewage into the drains that any special care and precautions was felt necessary. The method then adopted was the same as above alluded to, viz.: dip-traps were built and water-seals depended upon, and then the same

descending pipe, as well as the same drains, were used for wastes of all kinds, until quite recently, when the separation of soil-drains from other drains has been so much insisted upon, and gulleys of every kind provided for use.

Baths.—These are fittings that were a luxury scarcely known before this century. They were very little used even some thirty years ago, but they are to be met with now in new houses of 30*l.* per annum or under. Lavatories are also quite a recent addition to the accommodation of private houses, and lavatories and sinks for various purposes are now provided almost without limit.

Water Supply.—The City, which doubtless had suffered for generations from the pollution of all springs and wells by percolation from cesspits, had been supplied more or less with water from outside sources since the fifteenth century; but the new districts around, that had grown up and were rapidly increasing, were not so supplied before this century.

The Lambeth Water Company was incorporated by Act of Parliament in 1785; the Vauxhall Water Company in 1805; the West Middlesex Water Company in 1806; the Kent Water Company in 1809; the Grand Junction Water Company in 1811.

Before the supply of water by the several companies, the residents were dependent upon the wells in their houses, or upon the parish wells or conduits. The more plentiful supply of water provided by the companies facilitated the introduction and extended use of water-closets, as it has later on of baths and lavatories.

The water supply to houses was generally to one or more cisterns in the basement, according to the size of the house, one being invariably placed in the front area; and when there was a second, it was placed at the back part of the house. At first as the facility for a high service was very restricted, and the cost great, it was seldom adopted. A small cistern was however afterwards placed over the water-closet as such an addition was made to the house, and the water companies were able to give a higher service,

but such cisterns were often placed without hesitation in a servant's bed-room or under the floorboards of the bed-room.

The service in the house was at first by a tap in the side of the cistern, though it was soon extended to the sinks for general convenience. The waste from the cistern was by a trumpet-mouthed waste led direct to the drain, or to the trap under the water-closet apparatus, as the case might be, without any further trap or disconnection, and the supply was taken from the same cistern for all purposes.

Houses of a poorer class had one cistern only, or one for several houses in a court, frequently placed near, if not over, the water-closet in the yard that it had to serve, and a tap was attached to this cistern as a draw-off for all other purposes.

Stable-buildings were at first supplied by means of a tank under the floor of the coach-house, which served not only the general stable purposes, but the requirements of the family resident in the stable; subsequently a small cistern was added, at a higher level, to supply the water-closet apparatus and the residents.

The more extended sanitary inquiries of later years has brought about as great changes in the arrangement of the water services as in the drainage. Cisterns, owing to the want of constant service, are still necessary, but their position is more carefully considered, separate ones are now provided for domestic purposes, and all wastes are carefully kept away from drains. Filters are a modern introduction, and are coming into very general use attached to cisterns.

As to the Arrangement of Houses.—When water-closet appliances first were introduced they were required as much, if not more, for houses already built as for new houses. Such an addition to a house would appear to have been regarded, as not more offensive or dangerous to the health of the occupants, than the use of a commode, for which they were introduced as a substitute; and accordingly we

find the water-closet was erected in a bedroom or in a position nearest and most convenient of access from the family rooms. The necessity for external ventilation or even light was not felt, or it would surely have been supplied.

The general position for the water-closet on its introduction was designedly in the centre of the house, near the best bedrooms, and, where the descending pipe conveying the water from the roof was available for use as a soil pipe. Light and ventilation there was none, except by a fanlight or small window on to the staircase. Water-closets continued to be placed in a similar position even in new houses until near 1850, and in large houses there were frequently two or more so placed on the different floors of the house, and some that could have been as readily lighted and ventilated from the outside were not. The position of the water-closet for the use of the servants, and of those in houses of the lower classes, was frequently in the front vault.

Many houses formerly occupied by single families of the middle classes, but since becoming occupied by a family in each room, have remained without any improvement in this respect. They are still only provided with one water-closet, with a hopper basin and a defective supply of water, placed in a vault in perfect darkness, and where cleanliness is really a difficulty to attain.

This necessary accommodation in houses of more recent erection, is always placed next an outer wall, with better means both of lighting and ventilating, though still in many cases it would seem as if there was a fear of admitting too much light or air.

Additional cisterns and water services, and baths and sinks, have been gradually added to houses, almost without limit. At first baths were placed in bedrooms, but they are now more usually placed in a separate room. Sinks and safes under baths, &c., had their wastes taken direct to drains or soil pipes, but now they are made to discharge separately.

Ventilation.—I may make a few remarks upon the sub-

ject of ventilation. In houses built about 120 years since and later, the reception-rooms in large houses, and even generally, do not call for any special remark in this respect, but the offices and bedrooms were arranged rather to give the greatest accommodation than the best.

Borrowed light and borrowed ventilation was not considered to be undesirable, and the height and dimensions of the sleeping-rooms generally were of the smallest dimensions. With a height of 14 feet for reception-rooms, a height of 9 feet often sufficed for best bedrooms, and of 7 feet for the upper bedrooms, while the upper sashes were frequently fixed. The changes gradually adopted have been to make all sleeping rooms higher, and give them all direct external light and ventilation, and to add other means of ventilation besides open windows.

As a concluding remark, I would say that the alterations in the sanitary arrangements of houses, during the period I have referred to, have been gradual, and until recently very reluctantly, adopted. It has been, and still is, a difficult matter to persuade people of the necessity of making such alterations to their houses, and some prefer to ignore the fact that their houses are in an unsatisfactory state. There is a very prevalent idea that Officers of Health and Inspectors of Nuisances have had all objectionable arrangements done away with, and that no one would think of allowing any such to exist, whereas, I think it is rather a fact that those officers never interfere until the arrangements have become most defective, and are a serious nuisance felt by all in the neighbourhood, and that they seldom think of inspecting or interfering with the arrangement of houses of the middle and upper classes.

DISCUSSION.

Professor KERR, in commencing the discussion, said he would echo the hope of his friend Prof. Roger Smith that this opportunity would be embraced by the architects of London for explaining, in a more public manner than they often had the opportunity of doing, those matters of sanitary knowledge which they, more than any other class of the community, must be supposed to possess. Mr. Hunt had explained very carefully, though not quite so dramatically as he might have done, the way in which sanitary appliances had found their way into our houses. The time was not so very long ago when there were none of those appliances inside a house. Without going into the details, he would simply say that everything Mr. Hunt had referred to was at one time outside the house, and then there were none of those smells indicative of the presence of poisons with which sanitary science now had to deal. In fact, sanitary science had now to prevent evils which sanitary science, falsely so called, had created. The upshot of it all was that we had created underground an immense ramified world of filthy channels in which poison was continually generated under circumstances the most favourable for its development that human ingenuity could devise, and with that abominable underground world we connected in one way or other almost every room of our houses, and under the pretence of sending refuse into those channels we admitted into the houses the poison thus generated. He would only occupy a very few minutes in reading a few propositions which he had had on his mind for many years, and which contained his contribution towards the solution in part of the great difficulties with which they had to deal. He laid down first these preliminary observations:—(1) The atmospheric air has for perhaps its principal function the universal

work of cleansing. It performs this work automatically and indefatigably wherever it can force an entrance, but wherever it is excluded its work of cleansing cannot be performed. (2) Decomposition in the open air is comparatively innocuous; but when the air is excluded it is poisonous. (3) A house in this climate is a closed box from which the cleansing air is apt to be excluded. (4) Besides its own vitiated air, there ascend into the house foul vapours from the ground beneath. (5) The house is also in communication with an underground world of sewers, in which the gases of decomposition are constantly being generated, while the cleansing atmospheric air is primarily excluded. (6) All communications *from* the house to this underground uncleanness are communications *to* the house therefrom. (7) The cleansing atmospheric air will find its way into the house if it can; but the sewer air forces an entrance with still greater energy.

Now there were three ways to meet the difficulties described by Mr. Hunt. One plan it was impossible to suggest, namely, to do away with those appliances altogether. The second plan, to which he thought ingenuity was chiefly devoted, was to improve those appliances by increasing their complexity, and that he thought was a mistake. The third plan was to separate the appliances from the rest of the house, and that was the object of the scheme he proposed, and which he had formulated in the following proposals. They referred to the case of an ordinary street house of good class. (1) To form a separated vertical compartment or ANNEXE at the rear of the house, extending from bottom to top, and thoroughly open to ventilation, to contain all water-closets, all sinks, all cisterns, the bath-room, the lavatory, the housemaid's closet, the scullery, the butler's pantry in connection. This *Annexe* not to communicate with any of the living-rooms, but only with the staircase. All water-closets to have an intervening lobby, well ventilated. (2) To form in connection with this *Annexe* a vertical SHAFT, extending from bottom to top, and open at the top; to contain the water supply and service pipes, the gas supply and

service pipes, the flow and return heating pipes, all waste pipes, all soil pipes, all ventilation pipes from the rooms, the ventilation pipe from the drain. This *Shaft* to be accessible at several stages; to be large enough for a workman to ascend and descend by a wall ladder. (3) To form in continuation of this *Shaft* a SUBWAY under the basement floor, extending from the front to the back, to contain the house drains (soil separate), the water main pipe, the gas main pipe. This *Subway* to have a manhole at each end in the open air. The disconnection of the house drain from the public sewer, and the provision of all requisite traps, &c., are taken for granted. The efficient ventilation of the public sewer by appliances of its own is taken for granted. (4) All requisite *branch pipes*, for water, gas, heating, waste, and ventilation, to be capable of inspection and control from the *Shaft*, and to extend therefrom to the shortest possible distances. (5) Every apartment to be separately *ventilated* by means of tubes in the *Shaft;* and every apartment in the house, and in the *Annexe* to be directly accessible to the open air by windows. The effectual sealing of the bed of the house against ground-air is taken for granted.

With some arrangement of this kind, which might be readily carried out in a variety of ways, he considered that the healthiness of houses in towns might be secured in the most simple and effectual way possible.

Sir HENRY DYKE ACLAND, Bart., M.D., said that the historical account given by Mr. Hunt of this very curious subject, was well worthy of serious attention. As Professor Rogers Smith had reminded them, there was no doubt that how to deal with this matter was very much better understood 2000 years ago than now, and some of the works of the Romans in the neighbourhood of Rome, and in the neighbourhood of Carthage, especially as regards their water supply, were worthy of the utmost admiration of engineers, even at the present day, though no doubt they were not always constructed in a scientific manner. His attention was drawn to this subject forty years ago, and he mentioned

that, because, in order to thoroughly appreciate the present position, it was necessary to know what was the state of things, and how it arose, and then Professor Kerr came forward, and told them what was to be done. About thirty-five years ago, at a public meeting at Oxford, where he was beginning his education in these matters, one of the city authorities did not hesitate to state that he should look into the bottom of the matter, for he did not believe doctors were going to stop disease ; it was not their business. That showed how people, at that time, disbelieved in the efforts which were being made in a very effective manner by Lord Shaftesbury, Mr. Chadwick, Mr. Rawlinson, and a few others, and doubted the sincerity of the efforts made by the medical profession to stop the ravages of disease. It was a vulgar and low view of human nature, but that was a very common feeling. There was no doubt the origin of a great deal of the present evil was due to the great invention of "Bramah," who, he believed, invented the water-closet, some of the results of which invention, Mr. Hunt had far too tersely adverted to. One of the great features of the present day was that scientific architects, chemists, and physicians, casting all their pedantry aside, were doing all they could to popularize this subject, and to enable the people to see, first of all, the absolute necessity of doing this work, and also to let them see that architects were determined to remedy these evils, and to allow no new ones to be substituted for them. He must express his hearty thanks to the pioneers who had done this work so far, and also his confidence that the middle classes of this country would follow the lead of those who were determined to do their duty in the matter. Many years ago, from travelling in Asia Minor, he came to the conclusion that poetical historians were not quite right when they said that the great towns of antiquity, such as Sardis, Laodicea, and Nineveh, came to an end from what they were pleased to call political causes, which they could not define. He believed they came to an end because it was impossible longer to inhabit those filthy and fever-stricken places ; that the soil by long residence

was so deteriorated that, as it had been found in India, towns could not move, so they ceased to be habitable; and there were many places once densely populated now entirely abandoned. There never had been such a population in the history of the world as that in which they were living now, and it required the utmost skill and determination of the gentlemen on the platform, and their pupils, to avert similar consequences to those he had referred to from the modern cities of the world.

Mr. LEWIS ANGELL, M. Inst. C.E., said: To sanitarians who, for a quarter of a century or more, have been preaching and practising sanitation, it appears almost an anachronism to be discussing first principles at this latter end of the 19th century, and yet, considering how much ignorance and carelessness, not to say stupidity, continues to exist outside the circle of professors, it continues also necessary to preach and to re-iterate, and ding-dong into the public what ought to have been learned a generation ago; the defects referred to by Professor Kerr are not the defects of science, I agree with all Professor Kerr's propositions. The professor would not go back to the cesspools which honeycombed London and polluted the wells. Professor Kerr's various propositions are very excellent, but very costly, such houses could only be built under State control. How difficult it is to obtain "Common sense inside" as the President observed, compliance with the most elementary and obvious rules of sanitary science in one's own house. Given a sanitary house, such as suggested by Professor Roger Smith's paper, and its occupants will immediately set to work to minimise all the advantages provided by the architect. The domestics will deposit impartially all the fat, soap, tea leaves, and hair in the scullery sink, thereby choking and rendering the drains and traps offensive. They and their betters carefully shut all w.c. windows, and leave all the w.c. doors open, so that sewer gas, especially at night, induced by the warm air of the house, may permeate our bed rooms. In our large hotels may be found a whole battery of w.c.'s at the end of a bed-room corridor, with all the windows shut, and all the

doors open all night long. The crass stupidity of people in these matters is simply astounding, they despise the so-called fads of fussy sanitarians until conviction is brought home, in individual cases, by the unexpected, cruel, and irreparable sacrifice of the life of some loved one from preventible causes. I am speaking of houses as they are, not only of the houses of 120 years ago referred to in Mr. Hunt's paper; the houses which have their baths, lavatories, sinks, cisterns and w.c.'s all in the most complete inter-communication, with sewer gas, "laid on" in half-a-dozen parts of the house, especially to the drinking water through overflow and w.c. flushing pipes. In the house I occupy, a good substantial well-built family house of the last generation, I found no less than nine sewer gas services laid on to the house from the drains, exclusive of three w.c.'s. It is not long since, in the Mansion House of my Lord Mayor, three quarters of an inch of fungi scrub was found floating on the surface, and three eighths of an inch of mud at the bottom of the cisterns, while a bottle of water on his lordship's table was found to contain hundreds of nematoid worms. Again, at the Atheneum club the cistern was found to contain a large quantity of offensive mud and animal organisms. Look at the houses of the poor, as we pass over them on the railways, and even of the middle class, the cisterns or water-butts adjoining water-closets and dust bins, uncovered, exposed to all the surrounding impurities, and directly connected with the drains. There is no difficulty in designing a sanitary house in accordance with Professor Roger Smith's suggestions, but how few houses are *designed?* They are simply built; what percentage of houses built are designed by an architect? as Professor Smith has pointed out. And even when an architect is employed, who looks after the drains? The new Government Offices, Whitehall, to wit. They are too contemptible for even the builder's foreman to look after. They are left to an ignorant labourer who chops and twists the pipes about after the manner of his kind, and leaves the joints as exits for sewage and foul gases and entries for

vermin. To crown all, possibly the house may be built, as thousands are, upon an "eligible site," a gravel soil minus the gravel and plus the contents of the scavenger's cart. It may be thought this is an exaggerated statement; on the contrary, it is being done every day wholesale in and around the Metropolis, in which this Health Exhibition is being held. Outside the London of the Metropolitan Board there is no Building Act, building bye-laws *may* be adopted, but it is not compulsory on sanitary authorities to adopt them, they are permissive, they may adopt as much or as little as they please, or none at all; and if adopted, there is no administrative staff, no independent officer, to enforce them. Does the district surveyor in London look after them? Does the parish surveyor? The local sanitary authority may even consist of "jerry" builders and small property owners interested in evading the comparatively small cost of sanitary requirements. The only dwellings fit to reside in are the jails, workhouses, barracks, and asylums, mentioned by Professor Smith; but as this is a free country, and an Englishman's house is his castle, and he abhors officialism, the "jerry" builder and the land jobber may have their run until after another Health Exhibition or two, and a few cholera and smallpox epidemics, or until board schools (it is not to be expected from our grammar schools) teach sanitary science and the public mind thus becomes better educated. It has been suggested that the architect shall remedy these matters. The members of the Royal Institute of British Architects have but little influence over the dwellings of the British public. We are employed upon the parsonages, as Professor Smith observed, mansions of the rich and on public institutions, but the homes of the million have no architect, and I unhesitatingly assert, as the result of a long and varied private and official experience, that, however good the local building regulations are, and however anxious and capable the local officers may be, yet, as a matter of fact, there is no town in Great Britain where, in its true meaning, sanitary supervision is efficient. Although England is the cradle of

sanitary science, public opinion in such matters has made a greater advance in America, where in some of the States even household plumbing is now placed under official inspection, and licenses of qualification are necessary to practise the trade of a plumber. My suggestion is that a Building Act should be applied to the whole country, and that a fee should be paid to the local authority on every new building, so as to enable them to provide an inspecting staff. After very great opposition and difficulty, in which I was not assisted by the Royal Institute of British Architects, I was enabled to obtain in 1882 an Act for West Ham, a district abutting on the Metropolis, containing a population of 150,000, appointing Building Inspectors, whose salaries are provided by fees payable to the Local Board. Before this some 3,000 houses per annum were erected without any practical supervision. Local authorities and ratepayers will not pay a staff for such purposes. A small fee per house would be no hardship on the builder or owner, but in the aggregate would provide salaries for inspectors. What is good for London and West Ham and Ducal Eastbourne, is good and as necessary for the whole country. Until we can thus secure efficient building regulations and effective supervision, the public should look for themselves to the following cardinal propositions, for, although much besides is involved in making a dwelling healthy, after all, under our present system, "the drains" and pure water are the *most* vital points. There shall be no connection between the house and the sewers excepting for sewage, and such soil-pipe shall be trapped, and ventilated outside the house. All other drains or pipes from cisterns, baths, lavatories, sinks, &c., shall discharge by a free outlet into the open air. The drinking water cistern shall have no connection, of any kind, with the water closet. Every member of this Institute is of course fully aware of the vital importance of these requirements. I am only now repeating what has been said over and over again and referred to in Mr. Hunt's paper; but in what proportion of the dwellings in

this metropolis and in the country are they observed? Sanitarians are few and the population is large, but it is to be hoped that such an Exhibition as this, and such a Conference as that in which we are now engaged, may have an influence in the education of the people which will be far more potent than mere officialism.

Mr. WILLIAM C. STREET said so much had already been said that he could do little more than play the part of chorus. But with regard to the soil about London one thing, which Professor Kerr referred to, was of great importance—the sealing of the ground air. In districts where the subsoil was gravel, if the water was pretty close to the surface, the heat of the house had the effect of drawing up the moisture, so that a gravelly soil was not always an unmitigated benefit. On the contrary, if you dealt with a clay soil properly you might be in some cases equally favourably situated as if you were on the gravel. The question of light also was very important. He knew a school where, in the large room in which the higher classes assembled, the only light was from the north-west and north, and the only time when the children saw the sun was for a few hours in the afternoon in the summer. In London space was very important, and rooms were often built so close to one another at the back, with simply a kind of well between, that they were almost uninhabitable. You might have daylight reflectors, and all sorts of things, but you could not get light if you only had a well about twenty feet square between tall buildings. The question of light was not so much one of quantity as of proper distribution, and a moderate window area might very often be as effective as double the quantity, while the warmth and comfort was infinitely greater. The question of drainage was of course the most important, and, in fact, was the vital part of house-planning, and what all architects ought to be acquainted with, though it often appeared, from the outside aids offered, as if people thought architects did not know their business. The evil system of complicated traps would not effect safety, for trapping gas did not

destroy it. You must ventilate into the open air on the other side of the trap, or the remedy would only intensify the evil. Another thing they were plagued with was the so-called water-waste preventers, but he thought they were more frequently water-use preventers or water wasters. If they had a simple plan, such as was shown on the diagram he had put up, of a service cistern with a one and half inch outlet and a quarter inch inlet, it was not likely the handle would be lifted longer than was necessary, and the water companies even might find a great saving. His bedroom, in a house not very far from there, was at the back part of the house, the backs of his neighbours' houses being not very far off; if he were awake at night he could hear the water constantly running from several of those houses through these wretched arrangements which had broken down or been tampered with. It had been remarked that the Americans were in advance of us, and that in New York the plumbers had to be certificated, but he saw in an article which appeared in a New York sanitary journal about four months ago a sketch of a gentleman's residence, where a New York plumber had been at work, and he could only say that nothing could be worse, even in the jerry-built houses in London.

Mr. FAWCETT, M.A., said Mr. Angell had referred to the bye-laws of the Local Government Board, which he wished to see brought into general use; but he was not quite accurate in saying that any district might adopt as much as they liked of those laws or none at all. It was quite true they were not bound to adopt any at all, but if they adopted any it was not such parts as they liked, but such as met the approval of the Local Government Board. His suggestion would be that they should try and bring the meeting to some practical conclusion by memorialising the Local Government Board that these model bye-laws, with such variations as they might approve for local circumstances, should be made compulsory in all parts of the country. That would bring the whole country into a fairly sanitary condition. He had looked through those bye-laws,

and certainly thought they were very admirable and would meet many difficulties very well. He had conferred with some officers of the Local Government Board with regard to them, but the difficulty they expressed about making them generally compulsory was that whenever a town wished to adopt them there were various local circumstances that made amendments necessary. Of course it was very difficult to lay down a long set of bye-laws to suit every place throughout the kingdom, but some provisions certainly might be universal, and he would propose therefore that a memorial be sent to the Local Government Board to that effect.

The CHAIRMAN said he must say a word or two on this point, because he had had some little experience of these bye-laws in country places, and although as a rule they were exceedingly well laid down, there were many cases in which they did not apply at all, and where in fact they were positively mischievous. Now the surveyors were obliged to go by the letter of the law; they could not use their own judgment. Perhaps some of them could not be trusted with that discretion, but he knew as a matter of fact that he had been told to do things which he positively refused to do because they were contrary to common sense and ordinary judgment. He was afraid they could not consider that subject further, as it would require a separate discussion. With regard to Mr. Kerr's suggestion for an outside shaft, no doubt it would be an admirable thing where space could be given and expense was no object; but at the commencement of the meeting he had ventured to say that this subject concerned the houses of thousands and thousands of middle and lower classes rather than the rich, and the beautiful system Mr. Kerr advocated would hardly be applicable to the great majority of houses built in the neighbourhood of London. It would be too costly to begin with, and therefore they must endeavour to find some simpler plan to effect the same object, which he did not think would be difficult. It was perfectly easy in all

houses of moderate dimensions to provide that there should be no connection between the drains and the inside of the house—that everything should be external. There is no difficulty in saying that the drain as it passed under the house should be entirely sealed, and if this were done the greater part of the evil would be got over.

Mr. BOURNE (agent to the Duke of Bedford) said he felt some diffidence in speaking in the presence of so many specialists, but although he could not profess to give advice or even to criticise technical points, yet having the care of one of the large London estates, he had been obliged to give some attention to this subject. He had listened to Mr. Hunt's paper with very great pleasure, and could almost localise many of the phases which he had described in the history of sanitation in London. A large section of the Bedford estate was covered with houses built about the beginning of the present century, when all the sanitary arrangements were provided for outside the houses. Take, for instance, the southern end of Gower Street, immediately abutting on Bedford-square. That was constructed about the beginning of this century, and was built for the gentry. At that time the Attorney and Solicitor General, the leading members of the Bar, and some half dozen Judges, were living about the locality. They were not persons who would put up with anything that was offered them, but still in all those houses the closets were outside, each one having its separate cesspool, there being no sewers or public drains. Of course the architects were not to blame; they could only deal with the thing as they found it; they could not drain the houses into a common sewer when none existed, and consequently each house had its own cesspool, and was independent of its neighbour. There was an advantage about this, while there were some disadvantages; inasmuch as every house at all events was self contained, and if anything went wrong it could only arise from itself, not from its next door neighbour. Sometimes architects and surveyors were unduly blamed with regard to these matters.

Some of the lessees of those houses, while this agitation was going on, took it into their heads that something was very wrong in the house, and some good friend of his—a member of the Institute of Architects—was called in to remedy it, and he was blamed very much because he could not altogether get rid of a disagreeable smell, and he was told that Mr. Somebody or other said it was very unwholesome, and Dr. Somebody said it would produce typhoid fever. But the architect could not do impossibilities ; he could only take the house as he found it, and he could not suddenly convert a house constructed under one set of circumstances into such a one as he would build now if he began *de novo.* He mentioned this because the greater part of London consisted of houses built seventy or one hundred years ago or more, and the sanitary work going on at the present time consisted rather of adaptation and improvement—trying to make old things fit into new. With regard to new houses, he thought more legislation was wanted. On a former occasion he had stated that with regard to houses occupied by the poor, in his opinion nothing but the presence of the policeman in those houses would help to get rid of some of the nuisances complained of. Of course he spoke of the policeman as the representative of the law, and with regard to better houses also they wanted more law applied. It would be better if the district surveyors, who were all of them educated men, and trained specially for the purpose, were armed with more extended powers. At one time they could only deal with the walls of the house, now their powers extended to the foundations ; at one time they had something to do with the bricks, but could not interfere with the mortar, but their powers were gradually being extended, and he was of opinion they should have absolute power (and be made responsible for neglect to exercise it) to insist not only that ground air should be kept out of the houses, but that the drainage was thoroughly perfect, and no house should be allowed to be occupied until it was certified from actual inspection to be in good order. It must be remembered

that there was a disposition on the part of the people to rebel against all interference, and he found that if his estate surveyor went to a builder and told him he was not putting in a drain properly or anything of that kind, he rather resented it, but if the district surveyor told him the same thing he at once bowed to the superior authority of the recognised officer. He also remarked that in one respect poor people were better off in sanitary matters than those of the better class; usually they had but one w.c., and as a rule that was out in the yard. They did not indulge in indoor water-closets. On the Bedford estate there were one or two places where a few years ago his predecessor in office, smitten with the craze of improving the interior economy of some houses, placed water-closets on every floor, and he could assure the Conference that those houses were a source of great trouble, and the people in another street not far off, where there was but one water-closet for each house, and that closet in the yard, were a good deal better off. Referring again to legislation, he would remark that whilst the Metropolitan Board took care of the streets—made people set back their building line, and forced them to leave a certain space in front of their houses, he thought that they ought to go further and compel sufficient space to be left behind as well as in front. He knew there was a certain amount of space required at the back, but that provision was evaded in various ways; there ought to be a uniform strip of open ground behind every strip of houses. There should be as much open space behind as there was in front, so that there should be the possibility at any rate of having what Mr. Kerr asked for, which he was afraid was only a dream of the future, namely, having all the appliances outside the houses.

Mr. J. P. SEDDON said he desired to call the attention of the meeting to the general importance of the two papers which had been read. This was an Architectural Conference, and the only omission he detected in them was this, that although Mr. Smith had spoken of the

works of the Romans, and the middle ages, and other things as being admirable constructive works, they were something more—they were architectural works, and he did not want the Conference to separate under the idea that all they had to do was to consider this matter as if they were sanitary engineers. They would all agree in the importance of sanitary buildings, and that architects should be employed to design them; but more than that, when they looked back to the builders of olden days, those men who built the castles and mansions which had been referred to, they found that they had taken trouble to make them lovely as well as useful, and rejoiced in the result of their work. He had often been pleased in going through country towns to see buildings, which had been beautiful things in their day, in which the builder had evidently taken great delight, and he could not but imagine that such exquisite buildings must have a sanitary effect on their occupants, and he wished he could see more attention paid to this matter in the present day. Coming down the Thames the other day with an artist, and looking at some very remarkable ranges of buildings built about Chelsea, his friend made a suggestion that if he were the authority for buildings, he would insist that each architect before designing any individual house, should have the plans of the adjoining houses before him; not to make it exactly the same as they were, all carved out of one mould, but that it should not be utterly inconsistent with what had been done, and was going to be done afterwards. You often saw, even in the grandest streets, ranges of mansions abruptly broken and joined to others entirely out of harmony with them. Again, with regard to town architecture, it appeared as if people had some consideration for the appearance of the street façade, but if you looked out of the back windows you would find a sadly different result. He only wanted it to be borne in mind that these artistic considerations were not entirely to be lost sight of in considering the sanitary condition of the country.

The CHAIRMAN said he agreed with Mr. Seddon that

they ought to have regard for the beautiful as well as provide for sanitation. He also agreed with what Sir Henry Acland had said when speaking about the great Roman works; whether they were drains, or aqueducts, they were always Roman in their conception, grand and beautiful. Professor Roger Smith, though he had referred to the mansions and castles of olden times, had omitted any reference to the ecclesiastical buildings and abbeys, but it was remarkable that their sanitary arrangements were usually very perfect.

[Mr. C. Barry, F.S.A., here took the chair.]

DRAINAGE UNDER DWELLINGS.

By S. Flint Clarkson.

Some very simple things may be said naturally, if addressed to a resident in a good-sized house in a large British town, who wishes to learn how the appliances for drainage, shown in this Exhibition, are used. It will be easy to begin at the beginning in everything; and pleasant to fancy that he begins to learn now, because he has not been to an International Health Exhibition before, and not because he is dense or heedless. Usually bitter experience has taught the well-to-do householder some lessons; people who have suffered in health, purse and temper by bad drainage do not need much looking for. In the next generation we hope some searching out will be necessary. What is being done now is not all perfect, either in system or execution, but it may fairly be assumed that the best work of the present time will pass muster well for many years.

However desirable it would be to avoid drains under dwellings altogether, back drainage is impossible very frequently for terrace houses,—those houses put close together, which will always line the streets in the central portions of our towns. The sewers are in the streets, and the water-closets and sinks are where they must be, or

where they happen to have settled themselves—most often at the back. Anything which is desirable for other drains, in less important places, may be considered absolutely necessary for those under dwellings, which should, of course, be as near perfection as possible.

1. *What to avoid.* — By pointing out briefly the bad qualities of brick drains, such as used to carry away the refuse matters from dwellings, what are good qualities in drains generally may be perceived without an effort. New brick drains are rarely constructed nowadays, but plenty still exist under and round about houses, so that they are not as yet mere matters of antiquarian interest. We will hope that all here will live to see a bit of the last example put into a museum. The special sub-committee who have devised the insanitary house in the central avenue have judiciously decided to show only the *usual* defects, not exaggerating the ordinary conditions. A special pamphlet and a good show of special labels and diagrams will help—almost force—every one to see those defects. If they had exposed to reprobation anything practically obsolete, for the sake of the effective contrast of a very bad system, very badly carried out, with a good system, they would—doing it on such a scale and in such a permanent form—have been inartistic. For showing up persons or things with much effect, human nature insists upon the facts of the current hour being kept to very closely, and rebels if there is a call to hear of, or look twice into, an offence not committed yesterday or to-day. In a slight address, in which brevity is all-important, an awful warning is less out of place.

In brick drains (and in drains of rubble stone equally), the materials were porous—absorbing liquid foulness, and giving it out in foul air when stirred, half dry, or dry. The bottoms were too frequently of bricks, laid flat in mortar; the bricks grew loose, and the bed of the channel became a row of little cesspits. In true barrel drains the round bottom was usually covered with cement, but it was applied with difficulty, and frequently not very smooth. With any slight

disturbances the coating cracked, parts peeled off without anybody knowing where—renewal was out of the question ; there were thus always little pools above the porous bricks. Rats worked their way between flat covers and side walls, or enlarged any crack in a barrel. The bad air in the drain found its way into the building, and the rats too. With bricks, barrels were not made less than nine inches diameter, which we know is too large for an ordinary house-drain. Little streams of water turned through large flat-bottomed drains were shallow and slow ; and in nine inch barrels, with rough insides, there was but little improvement. The solid matter was left behind by the liquids ; flushing applied with the most extreme rigour could not cleanse such drains. They were (1) of porous materials ; (2) not smooth inside ; (3) with joints too frequent, and soon becoming imperfect ; (4) too large ; (5) difficult to cleanse.

No intelligent and careful use of the materials could get rid of most of these defects. The drains were, however, frequently laid with very little fall, (6) and this might have been different. But fall was often not easily got ; at the upper end the top of the drain was quite close to the surface, and the whole fall in 90 or 100 feet was next to nothing, varied by falls the wrong way. No swift rush of water seeking a lower level took place, and the drains became in time long cesspools. They were also (7) often in direct communication with the common sewer, without the interposition of a trap ; there was then a constant supply of foul air from foul sewers to the house drains. The drains were not ventilated (8). Perhaps a dip trap of brick and stone—a little cesspool in itself—tried to cut off the direct connection with the sewer ; but in all the pipes discharging into the house drains, there were water traps and no open ends—no induct or exhaust pipes. The drains were left to themselves with the utmost determination, and a faint hope that they would behave themselves decently. No attempt was made to change the air in them by passing fresh currents through. The foul air took its own course. Holes were eaten in lead pipes and traps, and vents made ;

and rushes of air took place at open joints, at imperfectly trapped sinks, and whenever waterclosets were flushed.

2. *Stoneware Drains.*—With a good system of drainage, everything generated in the house of an offensive and injurious character will be removed as fast as it is produced, and the drains will be watertight, clean, and full of fresh air. All the eight defects noted above may be avoided if good stoneware pipes are used as they should be. They are manufactured in many places in the United Kingdom and are not expensive, not nearly so costly as brick drains cemented inside would be. Well-burnt, hard, glazed stoneware pipes absorb no moisture; the vitrified glaze renders them as non-porous (1) as an old-fashioned brown drinking-mug; they do not corrode; they are quite smooth inside (2); once well cleansed the surface is what it was at first.

The fewer the joints the more perfect the drain. If one could be put down all in one piece we should do well, but Nature has apparently not arranged for this. In the stoneware drains joints occur at every 2 feet, and if properly made they are very lasting (3). [These numbers are those of the defects in the brick drains noted above; the contrast is thus pointed out, and the way in which a defect is overcome.] The length of 2 feet is convenient for making, firing, conveying, and handling; a length of 4-inch pipe weighs about 15 lb., and a length of 6 inch about 26 lb. In each batch of pipes there are failures which must be cast aside; they should never be sent out from the works. They may be of insufficient thickness, rough on their surfaces, too brittle, fired too much or too little, not truly cylindrical, or otherwise defective in form. The pipes are made thicker as the diameter is increased: a 4-inch pipe is $\frac{3}{8}$ inch or $\frac{1}{2}$ inch thick, a 6-inch $\frac{5}{8}$ inch, a 12-inch one inch. If too thin or brittle, the broken pipes will saturate the soil around them with foul matter; if rough on the surface, obstructions will occur; in either case the drain will be blocked up. If they are not truly cylindrical in form (or not truly oval in the case of oval pipes), one pipe will stand above another at the joint and stop the flow. An ordinary

pipe is constructed with a projecting rim or socket at one end,—a faucet into which the plain end of the next pipe fits as a spigot. The inside of the faucet and the outside of the spigot have parallel grooves to give a key to the material introduced to form the joint.

The lowest pipe is laid first, with the socket at the highest end. The plain end of the next pipe is placed in that socket, and the space between it and the socket is filled in with a mixture of cement and sand. Clay should not be used for drains under dwellings; there the joints should be as air and watertight and as indestructible as possible. Before the cement has had time to harden the interior of the pipe is wiped out very carefully. If this is not thoroughly done, a ridge or small lumps of cement will stick up at the joint. Long hairs, threads, pieces of cloth, or cotton stuff will attach themselves to such projections, soil will then cling, and a stoppage be managed sooner or later. To guard against such ridges or knobs joints have been treated somewhat as in iron water-mains, that is to say, strands of gaskin have been put round the upper pipe, so as to make it fit tightly in the socket, and then the cement packing, put to fill the rest of the socket, cannot reach the interiors of the pipes. Some lodgment results, however, and consequent imperfect cleansing, if the whole space between the two pipes is not solidly filled up with something as hard, or nearly as hard, as the pipes themselves.

A careful and skilful workman, taking a pride in his work, does a good many things and avoids a good many others, in the apparently so simple work of laying a pipe-drain. An unfilled joint, or one imperfectly filled, or filled with improper cementing material, is as troublesome as one from which the luting has been allowed to protrude. Nothing is more desirable than the recognition of care and skill, and the fostering by every means of an honourable pride, in the workmen employed in drainage work,—and frequently working in dirty holes, in darkness or semi-darkness, disturbed times and again by the passing

of other workmen and of materials, driven perhaps by an exacting or ill-tempered foreman, responding to the demands for quicker progress from an employer, rendered desperate by a proprietor to whom a poisoned goad has, it may be, been deftly applied at his domestic hearth. The temptation to think only of quantity without heeding quality must be strong at such times; average human nature is not abjectly subject to duty. The absence of special training should be remembered also in extenuation of faults. In times of pressure on the cheaper kinds of work, a strong, decently intelligent labourer has been known to leave pickaxe and shovel for a day or two and lay drains with a will. Special training, plenty of supervision and good lighting, should not be wanting for every length of good pipe that is laid. There should also be a general disposition to haste without hurry, and some special sign of appreciation from someone when all is found correct at the end.

Invention is always at work suggesting modifications in the forms of pipes, but the whole-socket pipes hold their own as yet. By using half-socket pipes every alternate pipe can be removed without breaking any pipes for inspection of the interior of the drain, or for the insertion of a junction to receive a new drain ; but it will readily be seen that a gain is balanced by a loss. Sockets are sometimes dispensed with entirely. Broad chairs of stoneware, each five sides of a decagon externally, are first set down, and the pipes are laid and bedded upon these chairs. When the whole have been inspected and tested,—saddle-covers are put in their places, with soft clay under them. Any saddle can be readily removed for inspection, or for putting in a saddle junction. Reasonable people do not demand a new junction very frequently, and for drains under dwellings, which are best thoroughly sealed up, no contrivance for the occasional removal of bits of pipes is in much favour. They may be useful at times elsewhere, but further mention of them may be omitted for the moment.

When Stanford's Patent Joint is used, skill and love of thoroughness will be of service in the workman who lays them, albeit the attempt is made to produce pipes requiring no skilled labour in the laying. The spigot ends of the pipes are trimmed, so as to prepare those not precisely accurate in form for receiving a perfect ring cast in a mould. The socket is chipped round, and a ring is cast on to it also. These rings are spherical in section, and the fit thus resembles that of a ball and socket-joint. The spigots and sockets are wiped clean, the sockets oiled, the pipes placed in position, and gentle blows from a wooden mallet send the upper pipe into its place; by a peculiar sound the workman knows when it is "home." Of course the preparation of the bed is very important still, and the keeping of line and level; besides the joints may be badly moulded on the spot, or chipped and damaged in transport if supplied on the pipes; the spigot-pipe may not be driven properly home, or mud splashings may be left on the joints. There are other special joints, but it is only possible to touch lightly on jointing, or indeed on any other division of the subject. After giving a little insight into general principles, inquiry into the merits or demerits of particular methods or inventions must be left to the hearer.

Stoneware drains are ordinarily made in all sizes from $1\frac{1}{2}$ in. to 24 in. in diameter. They can thus be obtained (4) of sizes not too large for house-drains, and can be easily flushed and cleaned (5). For families of any size the main drains are usually 6 inches in diameter, and the branch drains 4 inches. As the rate of flow in any pipe—the fall remaining the same—is quickened by narrowing the pipe and thus deepening the stream, any excess of size is really prejudicial.

3. *Some Defects in Stoneware Drains.*—When pipes are ordered hurriedly and arrive too late,—there is sometimes a wish to use those which have come, and not to wait further for the special pipes which ought to have been ordered before. When the changes cannot be made at the junctions,—pipes of one diameter should always be joined

to pipes of another diameter by diminishing pipes and in no other way. Patched junctions are painful shows of inefficiency; obstruction comes sooner or later when the filling-up breaks down into the pipe. Right-angled junctions cause trouble; a branch should discharge through a junction at an angle approaching the line of flow of the drain which is entered. When bends are required, but have not been supplied, straight pipes will be used with apologies, "so as to get the work done," unless there is interference. If the curve is of short radius the spigot ends will actually leave the sockets on their outer sides. Speaking generally, very bad stoneware drains will be of porous pipes, rough in their insides, broken and pieced with cement; some joints gaping, others leaking; some badly made with bad cement, some with projections of the cement inside; not sealed over; laid to curved and irregular lines, with right-angled junctions; the curves made of straight pipes, without diminishing pieces at change of size, and occasionally with larger pipes inserted in the run of smaller ones; without inspection chambers; put on new made or yielding ground; in parts running up-hill, and the rest laid to flat and irregular gradients.

4. *Iron Pipes and Subways.*—Some architects, in certain parts of their best work, use iron pipes with yarn and lead joints, similar to those in water-mains, in preference to any stoneware drains. In Paris they are always used,—not buried in the ground, but exposed to view. In America they are common, and compulsory in some places for drains under dwellings. They are enamelled inside, or treated by the Bower Barff (Rustless Iron) process. Mr. John J. Stevenson, the architect of the new mansions at Kensington Court, has taken great pains there, and used all the most modern sanitary appliances. He has kindly lent me a drawing showing the system pursued. Heavy cast iron pipes, 5 inches diameter, are laid in perfectly straight lines under the houses. They are lined with Dr. Angus Smith's composition, a preparation of tar, which gives a smooth and apparently indestructible surface. Joints occur at every six feet, and are thus one-

third of the number in a stoneware drain ; there are no difficulties with defective cement or the careless use of it. Being much more costly than stoneware pipes, the iron pipes are only used immediately under the houses.

Similar iron pipes were put by Mr. E. C. Robins on wall brackets in a subway—a kind of sub-basement—in the Museum of Building Appliances, in Maddox Street, Regent Street. This sub-basement is in fact a passage about 4 feet wide and 7 feet high, the floor 16 feet under the street level. Air is admitted to it from the area next the street, and there is a good sized shaft at the back about 30 feet in height above the floor. Other pipes are placed in the subway as well as the iron drain, and fresh air is led from it to supply the rooms throughout the building. The use of subways under the basement stories of London houses was advocated some years ago by Professor Kerr. He placed "an annexe at the back of the house to contain all the water closets, the bath-rooms, all cisterns and the housemaids' sinks, and draw-off taps. A vertical shaft within the annexe would run from the basement floor to the roof with an escape for air at the top. This shaft would accommodate all vertical pipes—water-pipes up and down, wastes, soil-pipes, gas-pipes, the heating circulation, perhaps the rain water-pipe, and the ventilation of the kitchen, and perhaps of the principal rooms might be accomplished by its means. The subway would contain all the horizontal continuations of the pipes from the shaft to the street, and also the house-drains. It would extend from the usual open area in front of the house to an open area at the back, and at each end there would be a manhole for access."

5. *Lines and Levels.*—Subways are luxuries which cannot be afforded every day. We will go back to stoneware pipes, with the remark that good materials, put together properly, must be put in the right place. Long straight lines are always preferable. It is more easy to get the levels right, and to see that they are so ; there are no checks to the flow, which is a very important point with water-borne solid matter ; they can be more readily tested

at first, and from time to time, and more readily unstopped. For a drain under a dwelling it is indispensable that it shall run in one straight line from the point at which it enters to that at which it leaves, and for a few feet more at each end.

At the junction of the straight lengths of the pipe drains, and at any bends, small inspection chambers are put; at the bottom of these a length of half-pipe forms the channel. When the cover is off the character of the flow of the drain is seen at once. Brickwork is carried up above the line of flow. The stone cover of the pit is bedded in mortar, and the joint round it pointed at the surface with cement. These are only opened when defects are supposed to exist, or when special cleansing of the drains is to be undertaken.

Having determined the lines which the drains are to follow, it is then necessary to settle the inclinations at which they shall be laid, in order that they may convey all effete matter quickly to the sewers, and be self-cleansing. Of course if there was too much fall, and the slightest check, the solids would remain and the water run away. But too much fall is the rarest thing; not being able to get enough is what we are wont to grumble about. The fall is strictly limited by the depth of the sewer below the lowest floor, and the necessity of keeping the drain well under the floor at the upper end; 2 feet under the finished floor is considered desirable, though we have sometimes to make ourselves contented with less. The least fall approved for 6-inch drains is 1 in 40, that is 3 inches fall in each 10 feet of horizontal distance. More is valued if it can be managed, certainly 4-inch drains should have more. When drains are laid to flat gradients some special means of flushing them must be used daily.

If the pipes are laid upon yielding ground they will not keep level; some will tip one way and some another, the joints will snap, and sometimes the pipes also, resulting in hills and dales, leaking joints, and stoppages. It is so easy to be wrong. Too much earth is taken out in parts of

the trench, and some of it filled back, and the ramming perfunctorily done; or nature may have interposed little pieces of yielding stuff between pieces of solid. A bed of cement concrete, carefully levelled on the top to the proper fall—a bed of artificial rock in fact—laid along the whole length, will give the pipes a fair chance. In this concrete, grooves will be made to receive the lower parts of the pipe sockets, and the whole of the length of each pipe will then rest on an immoveable bed.

Refilling the trench must be managed without disturbing the pipes. The hollows under them being very carefully filled up with concrete, it must also be put at the side of the pipes, with a thickness of six inches on each side, and then six inches over the top. Such a covering of cement concrete is usually stipulated for in byelaws for drains under dwellings; sealing up the pipes altogether as an additional precaution against evil results from defective jointing. It also serves to protect the pipes from displacement by impact on the surfaces above them.

6. *Disconnection from Sewer; Ventilation; Connection with Sewer.*—After the house drain has left the house, and before it reaches the sewer, a break is made, and the drain runs past an open space. On the side of this air space, next the sewer, is a water trap with a good seal, intended to prevent any bad air in the sewer from reaching the air space. If, however, this trap is neglected, or pressed upon a good deal from the sewer, tainted air will not enter the house, but will find its way out of the air space. From the air space fresh air enters the drains under the house, and a current is kept constantly moving through them by arranging ventilating pipes at the higher ends, which shall run up to the top of the building.

Some disconnecting traps are large, shaped pieces of stoneware, which shut off the sewer at one end, and receive the house drains at the other. A pipe carried up at the house end supplies the fresh air above the trap, when a grating at the surface of the pavement is objected to. With other traps the construction of a manhole is contem-

plated. This is a little chamber built up under the pavement of an area, through which the drainage is carried in half-pipes of enamelled ware. The trap is a syphon or U trap put on the side of the manhole next the sewer. A grating at the surface is sometimes put when there is plenty of space; more usually an air-tight iron cover is put over the man-hole; and a flue is constructed and filled in with a ventilator having small mica valves, which rise to admit air into the flue, but refuse to let the air come out. In time of storm there might be a set in the wrong direction—the long upright pipe at the back of the building might carry a rush of air downwards, and it would find vent at the induct and cause annoyance. Protected by these mica valves, the flue is unsuspected, and a moment of rest allows the pent up air to go upwards according to its wont. The manhole makes inspection of the drains easy.

The ventilating pipes, at the upper ends of the house drains, are of lead or of galvanised cast iron, well caulked at the joints, and all four inches in diameter, or as large as the branches they start from. The soil pipe serving the water-closet is usually extended upwards; being joined at its foot to the house drains without any trap, a current of air passes steadily through drains and pipes. Long branches must have special ventilating pipes; short ones will be cleared of air by the discharges, and supplied with freshened air from the main drain. These upcast exhaust pipes must not finish near windows or cisterns, nor be stopped at the eaves, so that they discharge under the open joints of slating; nor must they stop just above the tops of chimney flues, nor be carried into the flues themselves. If they are, bad air will reach the insides of rooms. Wires, or a perforated finial, must be put to keep out birds, or an approved cowl.

The drain should be connected with the sewer in the upper half, above the line of flow, at the haunch just above the springing. The custom at one time was to put the mouths of the house drains below the water-level in the

sewers, but this is given up now; the intention was to prevent sewer air entering the drains. Connections must join the sewers obliquely in the direction of the line of flow of the sewer. The pipe sewer junction blocks, invented by Mr. Cockrill, are a considerable improvement. Oblique junction blocks, and bends are used for brick sewers. Flap-traps are railed at and still used. The hinged valve allows a passage out from the house drain, but not into it; the flap closes by its own weight when the flow has passed through.

7. *Inspection, Flushing and Cleaning.*—Other connections with house drains for sinks, baths, rain water pipes, &c., the traps to them, and the ventilation of pipes and traps, form a branch of our subject, not forgotten but very extensive. The construction, maintenance, cleansing, and the efficient ventilation of sewers might seem another branch. Everybody is interested in it, architects specially so. It is well, however, for everybody to have his own province, and do the best he can in it, and architects are content with a province which extends, in large towns, as far as the walls of the sewers, but not beyond.

When the drains are completed, disconnected, connected and ventilated, they must be examined keenly before they are used, so that if by chance there are defects they may be remedied. If the lower end of the house drain is plugged and the pipes are filled with water and left for a few hours, and the level of the water in the testing bend has not sunk, it has been proved that pipes and joints are sound, that there are no vents for bad air, or cracks through which moisture will run away. The levels of straight drains can be tested by actual measurement, and the effectiveness of the gradient proved by floating down something in a good flush, and noting the time. At cast iron terminals, with air-tight brass plugs placed in a back area at the upper end of a drain, various tests for soundness and level can easily be applied. With drains in use, water mixed with lime is poured in at the end. By the amount and character of the discolouration of the effluent water, before and after

flushing, the condition of the insides of the pipes will be judged.

The beautiful arrangement shown by Mr. Hawksley (470, Class 22) for testing house drains and soil pipes with a plumber's force pump and gas pressure gauges, shows when there is any leakage, and localizes the leakage too. The traps act as plugs ; the ventilating pipes, and the end of the house drain next the disconnecting trap, must be thoroughly plugged up. The smoke test calls attention to important defects ; little holes may, it is true, be plugged up by some chance at the moment when the test is applied. Straw burnt in the drain may send smoke all along it, or smoke may be generated in a vessel and forced in by a machine. These appeal mainly to the sight. The peppermint test—a favourite one on account of the ease with which it is applied—appeals to the sense of smell, as does sulphur burnt in a shovel at the mouth of the disconnection chamber. Ether, oil of mint, and other strong smells have been suggested.

The difficulty in actual life is in getting anybody to look for defects periodically. Detection is disagreeable for one thing ; afterwards there is the remedy which seems—not worse than the disease it may be—but unpleasant and worrying. Mr. George Godwin, one of the honoured pioneers of all sanitary improvements, an architect who, forty years ago, showed the way in which all the world is now prepared to walk—pointed out constantly that "good health shows good sense ; that the laws of nature have been understood and attended to." This, in the present connexion, would mean that if a householder cannot get his servants to look after the drains at proper intervals, he had better employ a Sanitary Association or some one else to do so. The same thing might have been said of flushing years ago, but self-acting flushing tanks now do that work without being looked after. All that is necessary is to set a tap to run a small stream, and the drains will be scoured by the sudden rush of a number of gallons of water at the required intervals. 30 or 50 gallons liberated, so that the 6-inch drains are at

least half-full, clears away obstacles, and cleanses the surfaces of the pipes. Large flushes may indeed, if applied too frequently, damage the pipes by washing away the cement from the joints. It is well to be somewhat moderate in the use, except where the drains have little fall, then a daily flush is indispensable. The supply of air to all traps must be well provided for with these flushing arrangements, or the rush will syphon out the water from them.

The fine sand used in scouring metal behaves awkwardly in a drain, and grease is a positive terror. The amount of energetic invention expended on grease taps should appeal to every visitor to the Exhibition. Even with good flushing, occasional cleansing by absolute scraping and brushing is desirable. It ought to be set about at once when there are indications of trouble in the air. Traps and bends and branch drains should not be allowed to get wrong, but looked to from time to time. By bundles of screw-jointed canes any distance may be reached, and obstacles removed by means of rakes, balls, rollers and brushes, with comparative ease from drains laid in straight lines and to regular falls. Put shortly, all that is necessary for starting drains properly and keeping them right is, to use the right materials and put them together in the right way—in straight lines with proper falls, and to send plenty of water and fresh air through them.

A SHORT DESCRIPTION OF A MODE OF DISPOSAL OF THE SEWAGE OF A DWELLING-HOUSE SITUATED IN A LOCALITY WHERE THERE IS NO MAIN SEWER OR OUTFALL.

By Thos. Worthington.

In the construction of houses in rural districts an architect has few more difficult problems to solve than that

which occasionally arises where there is no outfall for the drainage.

During the erection of a dwelling-house in a country district where there was no means of discharging the sewage into a main sewer, and where it would have been most objectionable to turn it into an open ditch, I recently experienced this difficulty, and a description of the plan which I adopted may not be uninteresting to the Conference.

The house is situated on a somewhat elevated knoll, and has a garden of about two acres, there being a moderate fall for the drainage. All the drains are external to the house, and all soil, sink, lavatory, and bath pipes are disconnected on delivery into the trapped and ventilated gullies, which have special provision for cleaning by means of a simple lifting apparatus, enabling any lodgment of dirt to be removed with ease, so that with ordinary care and attention, the gullies may be kept perfectly sweet and clean.

The drains which convey the rain and surface-water are a distinct system, and being simply clean water are allowed to discharge into an open ditch ; but the soil-drain, into which all solid matter from w.c.'s, sinks, housemaid's closet, &c., are collected, is conveyed by a separate pipe into a specially constructed receptacle or tank-chamber in a corner of the kitchen-garden.

The tank itself is 6 × 5 feet internal measurement, and is 4 feet deep below the inlet drain. As will be seen by the section, it is divided into two compartments by a flag placed vertically. There is a drain to carry off the overflow placed a few inches below the level of the inlet-drain, and this is carried some distance from the house, to a dumb well formed in an absorbent gravel substratum, where the overflow water is immediately absorbed. Practically, however, the overflow very rarely comes into operation, as the liquid passed down the soil drain is not large, all rain and surface-water being provided for as before named, and the contents should be constantly removed for utilization ; but the overflow is necessary in case

of any occasional flood of water from the careless use of a w.c. or of a sink.

The first compartment of the tank C, which receives the solid matter, is constructed as a settling bed, and may, by the use of proper disinfectants, be made perfectly inoffensive.

This compartment should be filled with earth, or earth mixed with lime, and from time to time removed for garden use. Thus a constant supply of serviceable fertilizing manure would be provided, while the more liquid portion passing over the flag division into the second compartment D, would be not less valuable to a skilled gardener.

The walls of the receptacle or tank-chamber are carried up above the ground, and roofed over at a sufficient height to admit of a door being placed in the position indicated on the illustration. It is approached by an inclined barrow-way, so that a gardener can readily, by opening the door, and standing on the gangway, ladle out either the more liquid portion in the farther compartment, or barrow out the more solid deposit in the settling bed.

Manure-tanks are often constructed in country houses, sometimes with divisions to separate the solid and the liquid sewage, covered over by landings, and provided with a pump to raise the liquid manure ; but often there is no proper provision to ventilate, no arrangement for access, except at long intervals, involving much disturbance, and the labour of removing the flag cover ; so that practically, until offensive smells are observed, no attempt is made to correct them, by which time the drain gases may probably have poisoned the air of the house, and produced a fatal effect on the health of the inhabitants. In fact, such a tank, if left to the course of nature, becomes a retort, generating gases of the most dangerous kind, which will pass up the drains into the house, unless strong measures be taken to prevent it.

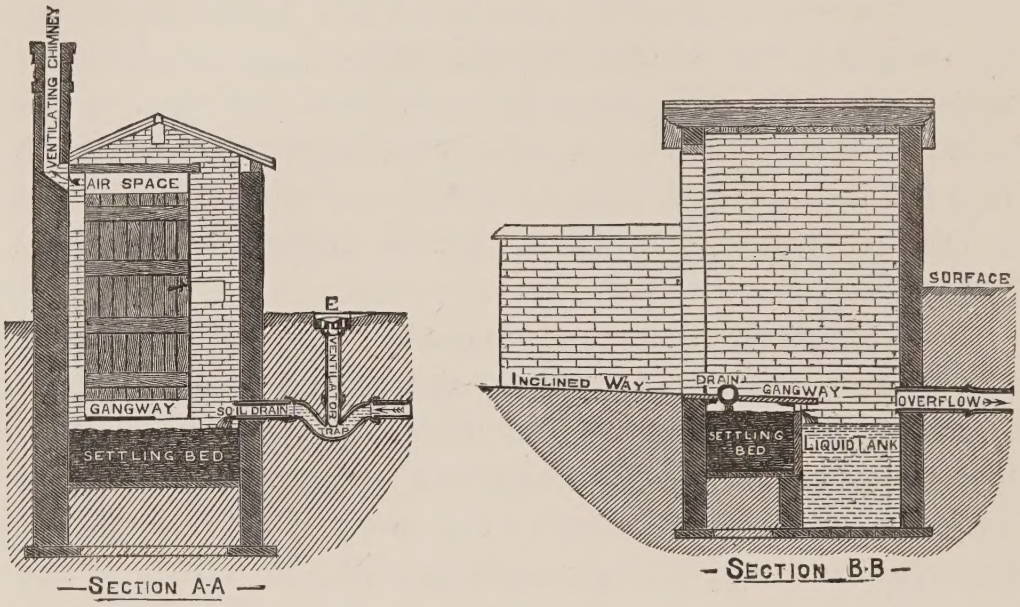
The plan described has the following advantages :—

All the drains (which are without exception external to

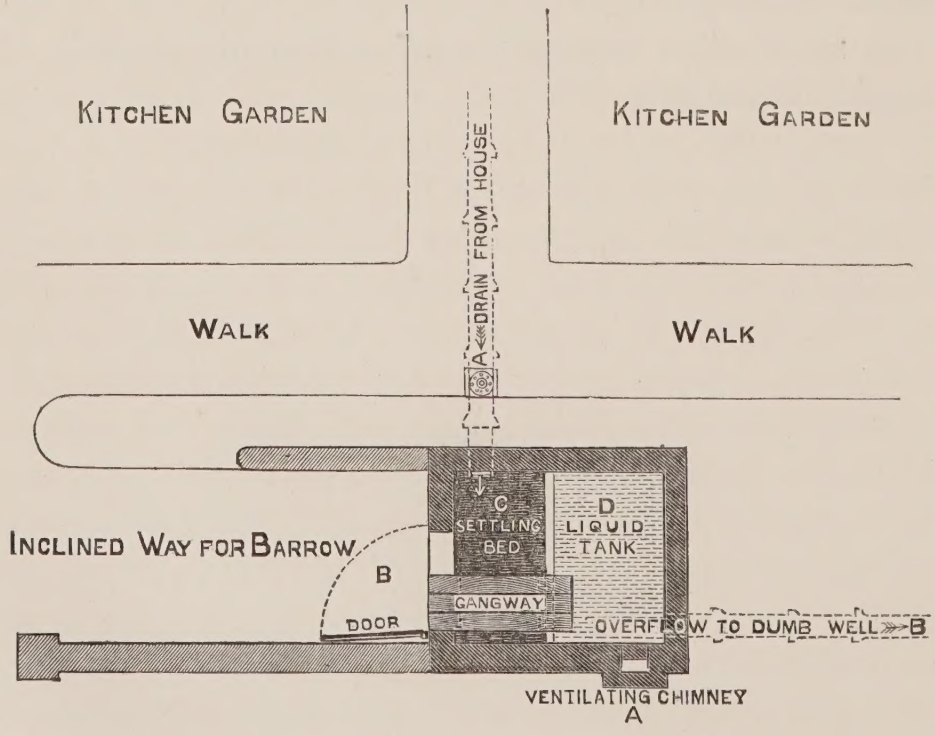
the house) are disconnected ; the gullies into which they discharge are thoroughly ventilated, and have the means of being readily cleaned by the lifting apparatus before referred to ; the soil and solid portion of the sewage is a separate system, and discharges itself from an open mouth into the receptacle in manner indicated, being trapped and ventilated just before the point of delivery (see E on illustration).

The receptacle or chamber has the means of ventilation at various points, over the door, at eaves of roof, and by a special ventilating chimney, so that the gases passing off into the open air become harmless, and are not likely to back up into the soil drain ; and even if this should be the case to a very small extent, the trap or gulley at the point E, is provided with the means of ventilation, as well as the gulley at the external wall of the house, where the pipes from the w.c., sinks, &c., discharge into the open gullies, so that it would hardly be possible for any foul air to enter the house, except through gross neglect of common sense precautions.

The illustration attached will sufficiently explain the foregoing description.



PLAN AND SECTIONS OF TANK CHAMBER.



PLAN OF CHAMBER AND DRAINS.

DISCUSSION.

The CHAIRMAN said the subject was a technical one, and rather an unsavoury one no doubt, but at the same time it was of intense importance, both individually and nationally, especially to those who dwelt in towns, not forgetting the possibility that a disease might before long reach our shores which mainly owes its origin to bad drainage. He therefore hoped that those who were skilled and had studied the matter would endeavour to enlighten the Conference upon it.

Mr. HUGH LEONARD said he rather gathered from the paper that Mr. Clarkson gave the preference to stoneware pipes instead of iron. Now for drains passing under a house, the question was of so much importance, the desirability of keeping any leakage from getting into the under portion of the house, and finally rising again, was so great, that the slightest possibility of danger ought to be avoided. It was only necessary to read the description Mr. Clarkson had given of how pipes ought to be laid, what care had to be taken, and the difficulties which might arise afterwards, to see that it was, at all events, a very ticklish and difficult thing to lay down glazed pipes so as to be and remain watertight. Now if this were the case in new houses what must it be in old ones? He thought these difficulties were so great as to make it almost impossible to ensure a really watertight joint, and therefore he had long been convinced that for such drains it was most desirable to employ iron pipes, which could be easily laid so as to ensure tightness, and if properly prepared were very lasting. He thought it would be well if architects would impress this matter on their clients, and point out that the trifling difference of expense was not worth consideration in comparison with the greater security attained.

Colonel LENOX PRENDERGAST said, one great advantage of this Conference seemed to be to get a variety of views on this most important question. No one had any idea of the

anxiety and worry of mind undergone by private individuals who wished to know what to do to secure good sanitary arrangements in their houses. For instance, he would take the last-mentioned point, the question of iron pipes, or stoneware pipes, under a house. He happened to be a member of one of the largest clubs in London, and during the last few years a large iron pipe arrangement was put in by a well-known engineer. Recently, however, he had seen it taken out again, and stoneware pipes put in its place. He happened to be down in the basement when the iron pipe was removed, and saw a hole as big as his fist in the iron pipe. Now, what on earth was an unfortunate private individual to do when the opinions of experts were so conflicting? One thing was quite certain, that in London we could not do without drain pipes under the houses. If you put a pipe under a house, the direction given by Mr. Clarkson as to a perfectly level bed of concrete was as good as you could have, but the private individual was in this position, that he constantly had to do with a house already built; sometimes it was the very best arrangement of, say twenty years ago. Then he went to one of the "princes" of the engineering sanitary profession, and he told him he should pull up the whole of the basement, and do away with all that had been put there, at such great cost. Surely, the attention of those who knew something about the practical working of these things should be directed, not only to the construction of new buildings, but to see how far they could disturb as little as possible any good work which had been done in previous times, adding necessary improvements only when absolutely requisite. It had been said that it was the easiest thing in the world to ventilate a pipe outside the house, but he begged to differ from that opinion. Half the houses in London had enclosed areas, and if they proposed to put a cut-off pipe in the middle of the enclosed space, it was very doubtful whether the remedy would not be worse than the disease. The object was to avoid contact with the foul air from the sewer, and it seemed as if men's minds could only travel in

one direction, namely, that the sewer air must go upwards to the house. Could not the process be reversed, and some downward current be made use of which should drive the foul air back into the sewer preventing its entrance into the building? He hoped that some time or other this would form a subject for the serious consideration of experts, for, while something might be done to prevent the presence of sewer gas, they could not rebuild the whole of the houses in London. Nor was it desirable that the ventilation of public sewers should be through the soil-pipes of private houses.

Mr. SCOTT MONCRIEFFE said, the last speaker had shown very clearly the great difficulties which the ordinary dweller in London had to contend with, not so much in carrying out what he knew, but in making up his mind as to where he was to go for information. Amongst so many rival schemes there was but small blame attached to the private householder if he held his hand altogether until experts had made up their minds as to what was really the best course to take. Mr. Clarkson's paper was of great interest from this point of view, and he was struck to find that he had occupied a great deal of that paper in the description of the method of laying earthenware pipes, and the difficulties attending the construction of such drains, and had spoken at much less length of cast iron pipes. Before long he believed the position of matters would be reversed, and the space occupied in such a paper with regard to the difficulties of laying stoneware pipes would be occupied in speaking of the difficulties in laying iron pipes, which he had no doubt would soon become much more general. Before taking to iron pipes on a large scale himself, he made enquiries as to the experience of others, and at the present moment there was a large concensus of professional opinion in their favour, Sir Robert Rawlinson had apparently made up his mind on the subject long before it had become a matter of general discussion among sanitary engineers; for on the 15th of February, 1883, at a meeting of the Society of Arts, he said that in London it became necessary to have drains under houses, but in

such cases cast iron pipes with leaden joints should be employed, ventilated back and front, and thus any chance of sewer gas might be avoided, but that even the best stone pipes were liable to crack and leak. On the same occasion another distinguished sanitary authority, Mr. Rogers Field, said it was impossible to tell whether a stoneware pipe was sound without thoroughly testing it with water, and very few indeed would stand the test, and that in New York the difficulty was so recognised that all drains under houses were directed to be of cast iron. This was confirmed by Mr. Butler, Engineer to the London Sanitary Protection Association, who said that he had during the last twelve months used nothing but cast iron pipes under houses when he was allowed to have his own way, as by that means the danger was reduced to a minimum. The difficulties with regard to stoneware pipes were perfectly obvious from the paper itself, but yet in the face of that Colonel Prendergast came forward and told them of a cast iron pipe with a large hole in it, and of course they could not gainsay that fact, that showed that a certain amount of caution was requisite, but in such case he should like to enquire whether there was any possibility of some corroding material finding its way into the drain. There might possibly be a chemical laboratory in that neighbourhood which took advantage of the drain. A subway in a case of that sort, or at least an open channel, so that the drain pipe was in no worse a position than an ordinary water pipe outside, or a gas and water main inside the house, would put the user of that drain in a very independent position even in case of corrosion ; but if a drain gave absolute immunity against sewer gas for a reasonable number of years, and if, when corrosion took place, it was perfectly obvious, and could be readily got at and repaired, there was not much to complain of. He should have said that if it were necessary to take up a cast iron drain, you could not do better than put in another, but so exposed, that if anything corroded it could be readily found out and remedied. There were, no doubt, many advantages in cast

iron—in the first place the strength of the material was far superior to earthenware, and sooner or later, he thought the discussion would turn on the possibility of preserving the iron from corrosion, either from the inside or outside. Sir Robert Rawlinson, had shown him specimens of iron drain pipes coated with Dr. Angus Smith's composition, which had remained underground twenty-eight years, and were practically as good as on the day they were put in.

Mr. E. C. ROBINS, F.S.A., said he had also seen the iron pipes just referred to, which were treated with a solution which, it is said, precluded their being injured by acids. A drawing on the wall had been alluded to in Mr. Clarkson's paper, of which he ought to speak, because it was connected with the question of iron pipes. In that case he had built a sub-way 4 ft. wide and 6 ft. high, where the drains were exposed to view, and they were suspended on wall brackets, being made of cast-iron, with leaden joints. That was not an original idea of his own ; he simply carried out the views of the person who employed him to build the house, showing that he had a client who was willing to do whatever he thought was best. The building itself was called an architectural museum, and it was built to contain a collection of appliances of sanitary apparatuses, therefore it might be supposed the owner was willing to spend a little money for the purpose of showing what his own ideas were, and what might be interesting to persons who came to view the museum. He was strongly of opinion, precisely the reverse of that held by Colonel Prendergast, that it was very important, instead of sending air down into the drains, that the air should be taken out of the drains, and not only out of the house-drain, but also out of the sewer. If the bad air went into the sewer, it would only come out, into the middle of the streets, at holes made for the purpose at every 100 or 200 yards. But if it were desirable to ventilate the sewers so close to people's noses as the middle of the road, it might be equally desirable to carry those outlets up to a higher point ; in fact, if there were openings made from the main sewer and

carried up to the tops of the houses, probably there would be less annoyance than there was at present, at all events, it would relieve the house-drains from the pressure which now existed arising from the difficulty with which the bad air in the sewers could pass through these holes, which were often stopped up. In fact, the street ventilators were so offensive to persons who lived immediately opposite to them, that they were sometimes covered with straw, and the consequence was, that the sewer having no direct ventilation, had only the house-drains through which to ventilate itself, which being situated at a higher level, naturally the bad air rose into the houses. It was therefore very important to ventilate the sewers ; and in the case he referred to of the house in Maddox Street, his client insisted on having a ventilator from the sewer side of the trap as well as from the house side. The whole of the arrangements were open to inspection, and the subway in which the pipes were carried were so clear and light that it was used as a channel from which the fresh air was admitted to all the rooms. There was a connection from it to every fireplace, and the air was passed through cold in summer and warmed in winter.

Mr. EDWIN T. HALL said this subject was one to which he had for many years paid a great deal of attention. The answer Mr. Robins had given to Colonel Prendergast's objection as to sewer gas passing into a house was a very obvious one. It was, he believed, a regulation of the Local Government Board, and certainly of many District Local Boards, that every house draining into a sewer should have a ventilator on the sewer side of the trap, carried up above the level of the ridge of the roof, which was a very great safeguard. He had several years ago adopted the shafts recommended by Professor Kerr, and found them a great success. All the pipes were carried inside them, and at every floor he had an external balcony with a door opening on to each, so that in case of any defect in the pipe the plumber should be able to work in the open air, thus obviating danger from fire. With regard to the flushing of

drains, Mr. Clarkson suggested that, in order to get an efficient flush the tap should be turned on occasionally, to supply a syphon flush tank which should send thirty or fifty gallons down the drains. It would be much better for this supply to be done automatically, and if a syphon flushing tank were placed underground in lieu of the ordinary rain-water catcher, the rain-water would automatically flush the drain. Of course in periods of long drought this would not be done, but ordinarily there would be a perfect system of automatic flushing. Another difficulty he had met with in one locality was with regard to the sewer, which was thirty feet below the building, and yet they were unable to have any basements—they were forbidden by the public authority—because the water in certain states of the tide backed up the sewer to within five or six feet of the road level. That was a very great difficulty which ought to be provided for by the public authority when it arose, for the system of private penstocks was most troublesome. The water supply for the efficient flushing of the drains was also very important.

The CHAIRMAN said the question of water supply would come up for separate discussion.

Mr. HALL said the only other suggestion he would make would be with regard to the straight drains under the houses. Of what material they should be constructed was perhaps a little outside the question mainly dealt with, but at either end of a straight length of drain there should be, not a man-hole, which was inconvenient, but simply a bend of the principal pipe brought up to the surface, and fitted with an ordinary earthenware cap, which could be sealed. The great advantage of this was, that at any moment the cap could be removed, an ordinary sweep's broom could be passed down, and by pouring down acidulated water the thorough purification of the drain could be secured.

Mr. HENRY DAWSON thought the important question for consideration was the most appropriate material to be used for drains under houses in different places. As to houses in London there was always a great difficulty with

stoneware pipes, on account of joints being only 2 ft. apart. Therefore, great advantage was derived from the use of cast-iron pipes, owing to the joints being 6 feet or more apart. From the very nature of a burnt clay material there would be a number of pipes delivered out of truth in the socket joints which always created a difficulty in making a tight joint ouside and a smooth joint inside. Many of the evils which had arisen occurred from the burr of cement or clay on the inside of the pipe. He thought from all they had heard to-day that the difficulty of correcting defects in pipes, from whatever cause they might arise—upon which point several of the speakers had advised that the pipes should be seen and exposed—showed the importance of being able to get at the pipes easily. That being so, he was never more astounded than when he was informed recently of a bye-law having been made in some districts with the sanction of the Metropolitan Board of Works that all main-pipes should be covered with concrete. The idea of having each time you wanted to examine a pipe to pass through concrete seemed to be reversing all laws of sanitary propriety. He thought that under ordinary basements a sufficient thickness of earth could always be had to cover the pipes, and it was well known that no better deodoriser than earth existed, not that there should be any need for a deodoriser, for if the pipes are placed on beds of concrete, there was no fear of settlement.

Mr. EWAN CHRISTIAN thought that the only safe plan of dealing with earthenware pipes under houses was to have them entirely bedded in Portland cement concrete. As to the deodorization by earth, he might point out that if the earth round the pipes became saturated, it at once became nothing more nor less than a cess-pit. Every single joint was a source of danger, and the safest plan for avoiding danger was that which had been so strongly objected to by Mr. Dawson.

Mr. F. H. FOWLER said he knew of no such bye-law compelling people to put pipes in concrete. What Mr. Dawson meant was the bye-law which made it necessary where houses

were built upon foundations of refuse, to take care that a good bed of concrete should be placed over all the area, in order that persons should not be injured. That was the only thing in the Act of Parliament which gave the Metropolitan Board power to enforce such regulations.

Captain DOUGLAS GALTON said that in New York iron pipes had been largely adopted, in fact their use was almost compulsory. An iron pipe was a very good form of drain pipe, though he did not at all say they might not secure an equally good drain by the use of stoneware pipes. One advantage in iron pipes, when used as soil pipes to carry the downflow of sewage, was that you could make the trap from the closet a part of the pipe, and then if any sinking took place the trap did not suffer. In cases of lead pipe connected with the closet, cases had occurred of the lead pipe sinking when the trap became separated from the pipe, and consequently became practically useless. There was one point in connection with soil pipes which should be borne in mind. It was very much the custom for houses to be built and then for a chase to be cut in the wall in which the soil pipe was placed. Now that cutting of the chase shook the wall very much, especially if it was not well built, and in some cases party walls might be damaged. Upon one occasion he had himself suffered from this cause. He found in his bedroom a very disagreeable smell, and thinking it might come from the closet in his own house, he had the soil pipe removed to the outside of the house, but as the smell was not got rid of he had the place carefully examined, when it was found that the soil pipe of the adjoining house, which had been let into the party wall, was thoroughly decayed. As regards drains under houses, he thought it should be a requirement that there should be an intercepting trap, as recommended by the writer of the paper, and that the drain from that, if it passed under the house, should be laid in a perfectly straight line to the other side of the house, where there was always a yard, and that there should be an opening so as to ventilate the drain. The

other subjects seemed to have been so thoroughly discussed, and he agreed so very much with the interesting papers, that he would not trespass longer upon the time of the meeting.

The CHAIRMAN said he felt that the meeting was very much indebted to Mr. Clarkson for having put in so exhaustive and perfect a manner the question of house-drainage, and he was sure they would read over the paper in its entirety quietly, and consider it carefully. One thing which had often struck him as remarkable, was the child-like faith with which people bought houses in London without making any inquiry, either as to their constructive sufficiency or their sanitary arrangements. If buyers of houses would make it an invariable rule before they bought to have the houses which they were buying carefully examined on the question of drainage and other important particulars, not only would they be saved from a great deal of inconvenience, but it would teach builders to be more careful in future, that is, if defects interfered with ready sale. With regard to the suggestion which had been made of driving the air back into the sewer, he might say that was reversing the law of nature, and it could only be done by machinery of enormous power, the employment of which was costly and very uncertain in invariable good action. Mr. Robins had referred to the subject of ventilating sewers by shafts, and this he thought was a most excellent suggestion, and at the present time was being constantly carried into effect in country houses. When the Metropolitan Board thought it necessary to take powers to put down sewers or main drains, that matter should be carefully considered, and shafts might be made part of the scheme, for in no other way would it ever be done. Reference had been made by Mr. Clarkson to the men who were actually employed in laying the drains under houses, and that gentleman knew as well as other people that the work was seldom entrusted to a skilled workman, though everything depended upon its being well and intelligently done. Now he could not see that in these

days of better knowledge of drainage and sanitary precautions, why there should not be a trade of drain layers employed by builders, for he was sure these men wanted just as much special education in their work as joiners, masons, or plumbers. Mr. Clarkson had summed up his paper with a few lines, which he thought was all that was necessary, but in so doing he did not very much help them, though it certainly was a very good conclusion to put before the meeting. The paper concluded in this way : " To put it shortly, all that is necessary for starting drains properly and keeping them right is to use the right materials, and put them in the right way." The difficulty was how to carry that out in practice. Education of all sorts had been rife during the last generation, and was still going on in every shape and way ; sanitary matters, among others, having been greatly studied ; and all they had to do as the outcome of meetings like the present, was to communicate to one another as much as possible the sanitary education which had thus been acquired, and also in perfect frankness tell each other of their failures ; and if they were so happy to be in that position, to tell each other of all their successes. In conclusion, he begged to propose a hearty vote of thanks to Mr. Clarkson for his interesting paper.

Conference on Friday, July 11th, 1884.

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1. "*On the Impermeable Construction of Roofs, Walls, and Basement Floors, with a Reference to Ventilation and Warming Incidental Th reto.*" By Edward Cookworthy Robins, F.S.A.
2. "*The Construction of Chimneys.*" By John P. Seddon.
3. "*Suggestions Respecting Doors and Fire-Resisting Construction.*" By Horace Jones.

The Conference resumed this day at two o'clock, George Godwin, Esq., F.R.S., in the chair.

The Chairman, in opening the proceedings, said he understood his duty was simply to introduce the gentlemen to read the papers, and afterwards to conduct the discussion, but it would perhaps not be considered out of place if he troubled the Conference with a few introductory words. The question of the well-being of the masses and their proper housing had at last taken a somewhat strongish hold on the public mind, and it might be hoped that something would come out of it. Many eminent men were now giving their best attention to the subject, and he had no doubt whatever that good would result. In the solution of this question no one was more interested or more likely to be called upon to give advice than the architect, and the Council of the Royal Institute of British Architects had shown their appreciation of this fact by instituting this Conference. Its object was not talk, either eloquent or otherwise; it was not sensational declamation, but it was instituted in the hope that by hearing the opinions of various men who had given attention to the special subjects concerning which doubt

existed, those subjects might be removed from the domain of opinion to that of certainty. The general subject of the Conference was the construction of houses and their arrangement, in such a way as to conduce to healthy life, but unfortunately the houses of the masses, to be numbered in thousands, were, with very few exceptions, not the work of architects ; they were put up to meet as far as might be the requirements, within a certain district, of the Metropolitan Building Act, and beyond that to meet certain bye-laws which had been passed by the local authorities. The public were not aware of this, and fancied that wherever a building had been erected an architect was concerned, and when the shortcomings of these structures were complained of, and their dreadful condition was commented on, and the absence of drainage and ventilation, and all other necessary arrangements was condemned, they always seemed to throw the blame on architects. The more fully, therefore, the public were made acquainted with the truth on this matter the better it would be, not merely for architects, but for the public also. He should have been glad to see a larger attendance, but unfortunately it required a great deal to attract the public to such matters unless they were personally concerned. If they were building a house, or had two or three children down with typhus fever, they began to inquire in the first case as to construction, and in the other case into the bad arrangements which led to those disasters, but otherwise they showed a most extraordinary apathy and carelessness, and fancied it was a matter entirely beyond their domain. At one time probably architects paid less attention to these matters than they should have done, but a change had now come over them, and when the public found that the importance of planning, of ventilation, and of all other arrangements for the promotion of healthful life were attended to by the architects, besides that cover of beauty which they had always been looked to to supply, more often would they resort to architects, and thus all parties would be benefited.

ON THE IMPERMEABLE CONSTRUCTION OF ROOFS, WALLS, AND BASEMENT FLOORS, WITH A REFERENCE TO VENTILATION AND WARMING INCIDENTAL THERETO.

By EDWARD COOKWORTHY ROBINS, F.S.A.

THE enclosing walls of every house are an important factor in considering its sanitary condition; so also is the roof covering, which together with the walls, constitute its power of resistance to the winds and weather of our inclement climate. Until late years, however, the site covered by the walls and roof of any building, has been thought to be sufficiently protected by them, and the existence of such a thing as "ground air" has been ignored in constructing the lowest ground or basement floors of buildings.

Having myself witnessed Dr. Renk's experiments at the Hygienic Institute at Munich, which he has been for years carrying on under the supervision of Dr. Pettenkofer; I am able to speak from ocular demonstration concerning the penetrability by air and water of the materials commonly used in the construction of buildings both public and private.

There are circumstances under which it may be desirable that the air should find its way through walls; for example, wherever no other means are provided for the change of the air in dwellings, indeed were it not for the flimsy construction of the houses of the poor, and the passage of the air through the outer walls, and through the crevices about door and window openings and basement floors, the air of the rooms would become perfectly stagnant, and be much more unhealthy than it is. But in the construction of the houses of the future upon sound sanitary principles, it is, of

course, presupposed that nothing comes by chance, that the providence of the designer anticipates and provides for every contingency, and thus puts under the control of the occupier the means of warming, ventilating, and maintaining in healthful condition the house he inhabits. To attain this end, it is obvious that in the first place, it must be possible to ensure that the basement floor shall be impervious to ground air and moisture.

But what is ground air? It is the superincumbent pressure of the external atmosphere which passes through the earth subjected to its pressure to find its escape in the direction of the least resistance, which direction is commonly that forming the site of a house. The resistance to this external pressure is much reduced by the temperature of the air within the house, which is usually much higher, and consequently much lighter; so that there is every inducement from natural causes for a stream of ground air to be continually passing through the basement, or lowest floor from without, unless steps are taken to construct an impervious flooring, the resistance to the passage of the air through which shall be greater than the pressure.

When the earth is clean, and the house is pure, there may be no great harm in allowing this process to go on, but for one consideration, viz. the humidity of the air so passing during wet seasons. But in populous places where the earth is fouled by innumerable accumulations of refuse of all kinds, where defective drainage has rendered pestiferous the very soil upon which the house stands, and leaky gas pipes have rendered the external soil black and reeking with gaseous deposits, &c., &c.; I say under these circumstances, it becomes a matter of enormous moment that the house itself shall not be made the safety-valve for the reception and accumulation of all these abominable impurities in the form of imperceptible "ground air."

1. *Impermeable Basement Floors.*—There are two ways of overcoming this evil. The one is by forming an impervious flooring as before mentioned, and the other is by constructing channels under the floor leading to the

kitchen chimney flue; these channels should be of porous materials, and should be six feet apart, and by being carried to the kitchen chimney the ground air will be drawn off with the heated air and smoke of the chimney, and tend to increase the draught in the flue at one and the same time. This was accidentally discovered by Dr. Renk during his experiments at Munich, for being unable to account for the difference of ground air pressure in different parts of the basement upon which he was operating, he excavated the floor, and found that one of the air flues from the chemical laboratory passed under the basement floor to the foul air extract shaft, drawing with it the ground air in its immediate vicinity, thus relieving the pressure upon a certain area, and giving the confirmatory exception to the rule he was formulating.

The ordinary materials for paving basement floors are all of a very porous character, and where boarded floors are provided no attempt used to be made to cover the soil at all, till the last amendment of the Act governing these matters, required a thin layer of lime concrete to be laid over the earth under the floors generally.

The experiments made on various materials show that hydraulic cement is almost impermeable, and a layer of cement concrete covered with pure cement, or an asphalte surface, or concrete formed of Portland cement mixed with granite or slag chippings and finished with a smooth surface, will answer the purpose desired. But for the sake of comfort and warmth to the feet, it is often desirable that wood should be the covering. This is equally well secured by the adoption of one or other of the many excellent wood block floorings exhibited in this great International Health Exhibition, to be laid on 6 inches of cement concrete. The blocks need not be more than 2 inches thick, and should not be less than $1\frac{1}{2}$ inches thick and 6 inches long by 3 wide. They should be dovetail grooved at the bottom, burnetised before using, and bedded in cement. Powdered cement should be brushed into the interstices after the laying

is complete, and the surface well washed with pure water and left clean.

Deal, pine, pitch pine, oak, walnut, teak, most kinds of wood will do, which may be planed or polished, and laid in any variety of pattern, equivalent in beauty to a parquet floor. Where there are no basements it would be better that all the rooms should be thus paved, the difference in the purpose of the rooms being expressed by the character of the design and the quality of the material used. Vitreous porcelain tiles are best for passages, being both impermeable and not slippery on the surface. But excellent tiles of every kind are now available for the purpose; and are most easily kept clean. In the Belgian Court is exhibited an oak parquet floor dovetail grooved underneath, which is secured by mastic to a 12-inch square cement tile. I show it as an example of an impermeable floor suitable for all positions, 2 inches thick, to be had from 1*s.* 6*d.* a foot superficial.

2. *Impermeable wall construction.*—In the second place, let us consider briefly the case of the enclosing walls of a building. Nothing but the observation of carefully conducted experiments will enable you fully to realise the remarkable porousness of the ordinary building materials used for the external walls of dwelling houses.

The impermeable qualities of Terra Cotta give it a foremost place in the decorative construction desirable in all buildings. Mr. Waterhouse has proved its value as a material for use in the Metropolis. The Natural History Museum has the exceptional advantage of being, as it were, cased in Terra Cotta.

In the erection of buildings of the ordinary porous materials, however, precautions may be taken to achieve a similar result.

There are a variety of systems for forming hollow walls. The inner and outer casing being connected with strips of bent iron galvanized. All excellent in their way.

But hollow walls are not always efficient, and are rarely

perfectly well done, and, of course, leave a space into which bad air can accumulate, and vermin may some day find their way and be unable to get out and die there, and thus vitiate the air of the building. The system is costly too, and covers a larger area than solid walls, when the walls are less than 2 bricks thick.

There is another system which makes a wall at once air and water proof so far as it extends, leaving nothing but the crevices in the ill-fitting of the joiners' work of doors and windows, which only good workmanship can eliminate.

It consists of an asphalte bond between the inner and outer casing, applied in the following manner. Let us suppose a 14-inch wall, on one side 9 inches of brickwork, on the other 4½-inches, with 1-inch division between, the opposite joints being left free of mortar for about three-quarters of an inch each. At every two or three courses the heated asphalte is poured in, and the crevices all filled up with this impervious material, and the result is a wall much stronger than the ordinary wall, occupying no more space, and perfectly wind and weather proof. Impermeable water tanks may thus be constructed, an example of which may be seen in the Parkes Museum. The asphalte used is "Hygeian Rock."

In facing with stone work, this will be found a valuable accessory, but the preservation of the face of the stone will not be secured, and another and a wider question is opened up, as to the best kind of preserving solution for treating stone and other porous facing materials, and preserving them from the action of the weather, and the disintegrating gases afloat in the atmosphere, which are found to be so destructive in London and the manufacturing towns of the provinces. But before discussing this question let us return to the impervious walling to observe that there is still a weak point not rendered impregnable to damp air.

3. *Damp Courses*:—The asphalte must not only be applied vertically but also horizontally at the foot of the

wall and at the level of the lowest floor adjoining. In fact, the asphalte may be continued at the level of the underside of the wood block basement flooring and so seal up the walls and floor.

This horizontal course in walls is called a damp course, and is usually applied, but when it is absent, the result is, that damp rises in the walls forced up by the pressure of the ground air by the variations of temperature, by capillary attraction, &c., and the plaster becomes demoralized and falls off the walls, and considerable discomfort and expense is the consequence.

The following sketch (No. 1) shows the application of the Hygeian Rock Asphalte—which has the peculiarity of greatly strengthening the wall as the experiments on arches recently made conclusively prove. I am now using it on a large scale in the construction of the walls and damp course of the Congregational school at Caterham.

I now exhibit three blocks of different walling:—

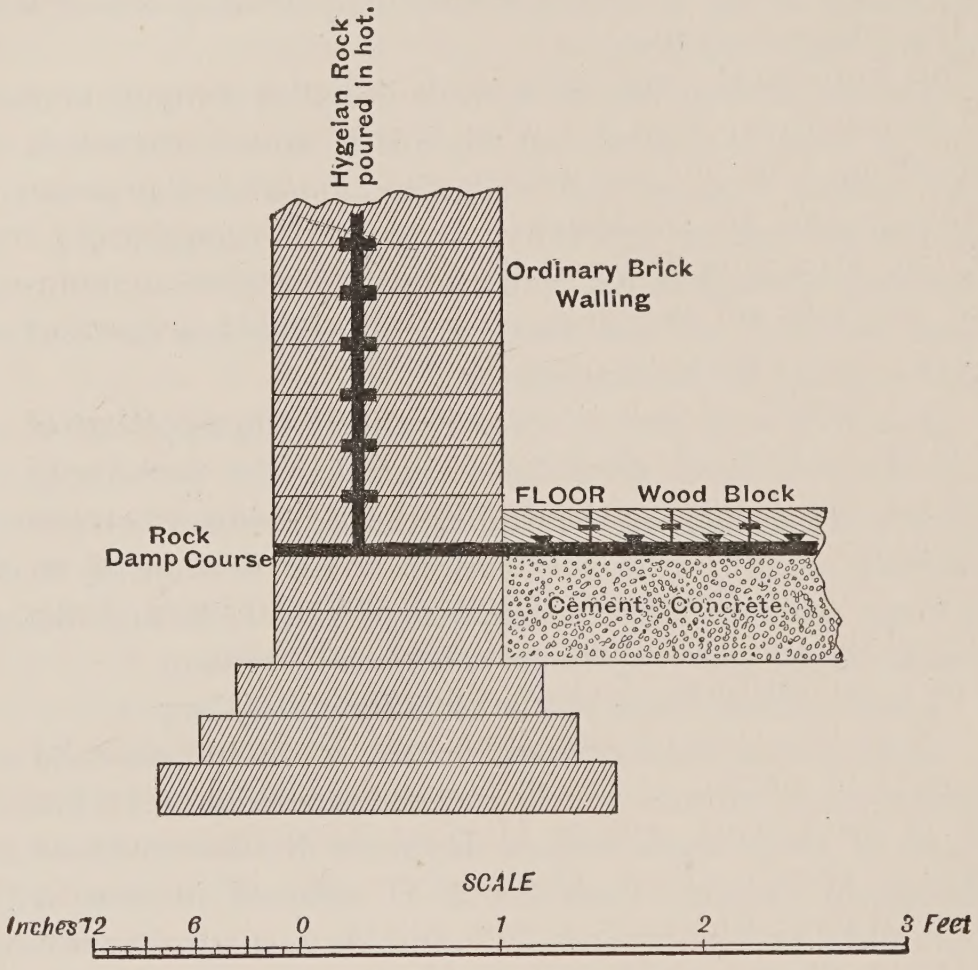
1. 14 inches cube of bath stone. 2. 14 inches cube of brickwork in mortar. 3. 14 inches superficial and 9 inches thick of brick work with a Hygeian Rock introduced as shown in sketch. Each block is encased in zinc with pyramidal projecting ends, at one side is a small opening to pass in air, and at the other side is one to let it out. The air will rapidly pass through the two first blocks, but will not permeate through the third.*

4. *Preserving Solutions*:—This was the subject of an interesting discussion at the Institute many years ago, under the presidency of the late Sir Wm. Tite, and in the transactions of the Institute the whole matter was very carefully reported.

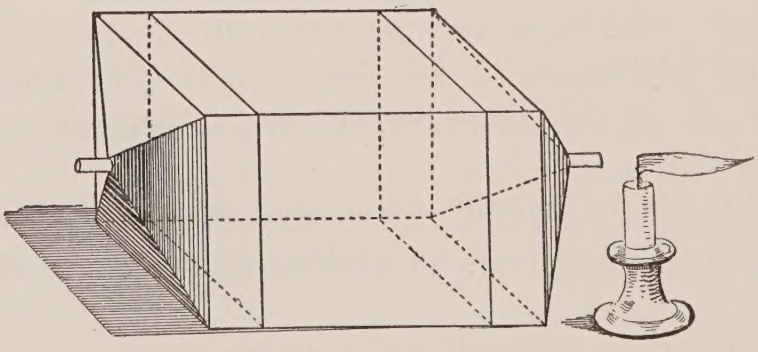
I invariably specify that the stone-work shall receive when in a dry state, two coats of a solution, the effect of which

* The lecturer here successively extinguished a candle by blowing through each of the first two blocks; but all the force of the attendant using a pair of bellows could not make a passage for air through the third block, and it had no perceptible effect on the flame of the candle held at the opposite opening. (See Sketch No. 2.)

No. 1.



No. 2.



BLOCK OF BRICKWORK INCASED WITH PYRAMIDAL CAPS, FOR TESTING POROSITY.

is to render the surface of the stone comparatively impermeable, at all events, till such a time as the stone has had time to weather and form its own skin and natural protector from the weather. In fact, wax and gum are dissolved in a spirit, and the solution is applied with a brush on dry stonework—the spirit volatilizes, and the congealing of the rest forms a skin as thick as the stone is impregnated; two coats are usually sufficient to preserve the stone till its own natural weathering completes the process.

At Hanover Church, Regent Street, may be seen three different processes, none of which have as yet shown signs of failure, where applied to new stone.

The building had become perfectly black, but very few signs of decay had taken place except in the towers, and I was desirous of removing the soot without taking away the weathered surface of the stone, and this I achieved by the use of the wet steam jet.

I also discovered that the portions which had been treated with linseed oil had not decayed to any extent, while the rest was so far gone, that the greater part of the stones had to be replaced.

Of course a great deal of the defective stone we see arises from injudicious selection; there is good and bad stone of every kind, and unless pains are taken not only to select the quarry itself, but to mark the approved stones at the quarry, and then to see that they lie in the building on the same bed that they lay in the quarry, disappointment must ensue whatever the solution you employ; solutions should only be used to preserve good stone, not to make bad stones pass muster. The selection of the stones at the quarry has hitherto cost me not more than 10 to 15 per cent. extra.

5. *The Roof.*—A very few words must suffice to dispose of this subject, having regard to our limitations as to time. It is not my intention to speak of flat roofs of fireproof

construction, and covered with impermeable materials of various kinds; obviously they are rarely required, and when wanted, only need to be well executed to answer the purpose intended. But the ordinary house-roof is a thing that forms a hat to a building; it may or may not have projecting eaves, or a brim to the hat, but is always presumed to rise above the greater part of the topmost rooms, and to form an air space protective of the inmates from the extremes of heat and cold. That this is but a presumption is, in many cases, only too true, and the cruelty of putting servants in slate, or even metal-covered attics, within a few inches of the outer air, is often forgotten alike by the builder who sells, and the master who buys his family residence. A sufficient air space between the ceiling and the roof is indispensable for dryness and for the preservation of the timbers of the roof.

The ordinary speculative house-builder gets the cheapest slates, often absorbent of moisture and permeable by the sun and wind, and he fixes these with common nails to sappy battens, secured to light rafters at the least available gauge, instead of making every third slate lap the first, at least, three inches, and be fastened with two copper nails to each slate to inch rough boarding, through which the snow may be further prevented from finding its way by putting an intermediate layer of inodorous felt, and thus keep back the heat and the cold and the rain and the snow, and form a sound external covering to the house.

Zinc does not last above a dozen years in the English climate, as a rule; but if used, it should be put on with laps, and without soldered seams or anything to hinder its free expansion or contraction, and should be put in much thicker than is customary—say No. 15 gauge.

Lead forms the best and most durable roof covering, properly laid, of sufficient thickness—say 5 lbs. weight for the square foot for ridges and flashings, 7 lbs. for gutters and flats. But nothing is more effective than tiles, and nothing, when well done, warmer in winter or cooler in

summer. The Brosely tiles are admirable in colour and hardness. Vertical tiling to brick pugged walls cemented both sides are excellent.

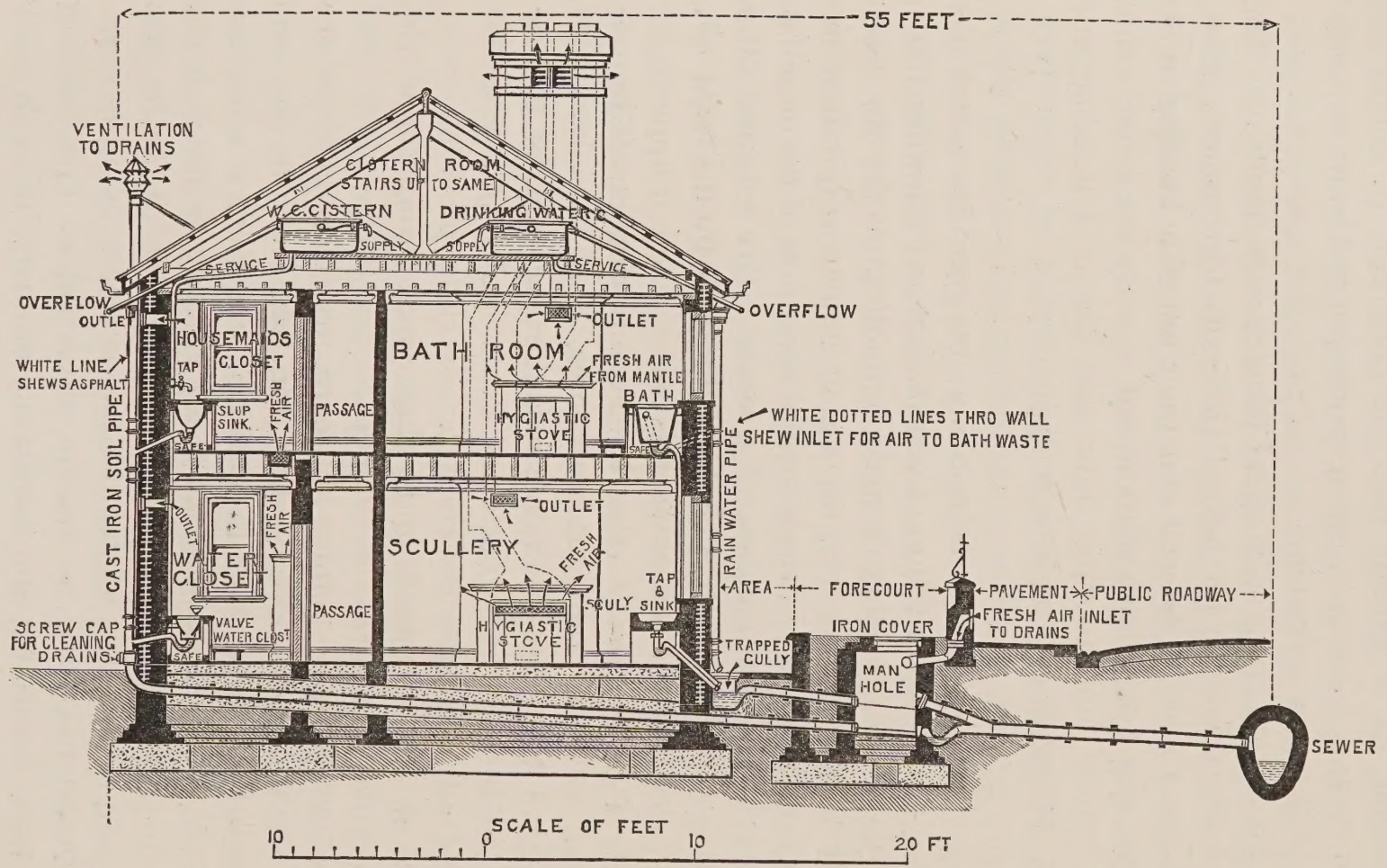
Projecting eaves are a great protection to the walls; and the projections on the face of the walls for cornices, labels, strings, should all be well under-cut, not only because of the good effect of a sharp shadow, but because the water is thus prevented from running down the face of a building and disfiguring it, and making it damp.

6. *Ventilation.*—It is not my purpose to enter very deeply into the question of ventilating and warming, but it is obviously necessary to make suitable provision for ventilation, not only for the purposes of human respiration, but for the sustenance of the healthful condition of the materials used in the construction of a house. Dry rot, and other forms of premature decay, being induced by the want of a free circulation of air about the places where it appears, the best proof of which is, that by the introduction of the air, the growth of the fungus is arrested.

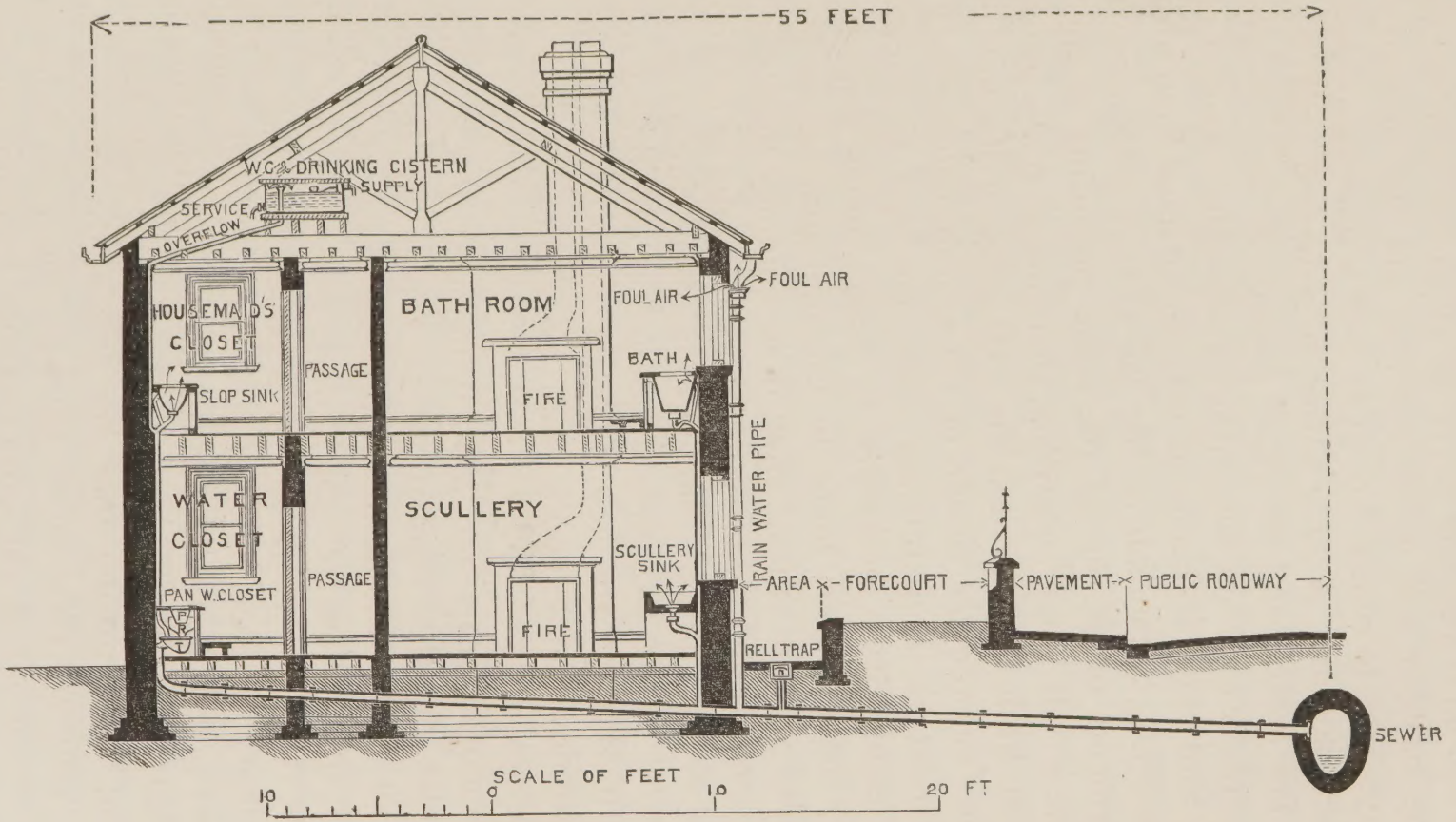
As I have already remarked, the exclusion of the external air from the enclosing roofs, walls and basement floors of dwellings, renders it necessary to provide ventilation of a simple kind, and I shall conclude my paper with a few remarks upon the subject.

If we have something to learn from foreigners of the scientific application of the principles of warming and ventilating great public buildings, as I have elsewhere shown, foreigners have much to learn from us of the domestic comfort derivable from the homely fireside of the English people. That it is wasteful of fuel is true; polluting to the atmosphere cannot be denied; nevertheless it is the best system of warming and ventilating ordinary living rooms.

Ventilation is the means by which the air in a dwelling is kept sweet by its continuous change. This is only possible by the admission of fresh air, and the extraction of vitiated air. It is not necessary to go into the chemical constituents of good or bad air, it is well understood now



EXAMPLE OF A SANITARY HOUSE.



EXAMPLE OF AN UNSANITARY HOUSE.

that bad air is stagnant air, or air which has been exhausted of its oxygen and needs renewal, and the difficulty has always been to renew the air in such a manner as shall not cause draughts. A lady sitting in a heated concert-room will fan herself, and the rapid passage of the same heated atmosphere over her face makes a refreshing draught about her; and where no cooler air is to be obtained from without, as in India, a punkah or big fan is kept going, the rapid movements of the air of the room producing an effect of coolness. It is not surprising, therefore, that the introduction of fresh cool air and the extraction of the fœtid and warmer vitiated air should be felt as a draught, even if its movement is comparatively slow; nor that to overcome this feeling, it is necessary to adopt many expedients. Every room in every home in England may be said to be provided with an extract shaft in its chimney-flue from the ever open fire-grate, carrying away in winter two hundred feet of air per minute. But few rooms have any corresponding inlets, and so to supply the omission, whizzing draughts come in through the key-hole and crevices of the doors, and windows and floors, and even through the walls themselves.

A hundred years ago John Whitehurst, F.R.S., wrote a pamphlet on the ventilation of rooms by introducing fresh air from without to supply the want of it within, the full particulars of which were given by me to the R. I. B. A. a few years ago in a paper "On the relation of Sanitary Science to Civil Architecture." It consisted of tubes placed in the corners of the room, something less than half the height of the same, whose collected area was one fourth greater than the area of the chimney-flue, the air entering these tubes through the walls below the floors, passed out at the open top with a current sufficient to carry the air to the upper part of the room, from whence it distributed itself without draught like the spray of a fountain, and fed the flue so that no pull was exerted upon the cracks and key-holes aforementioned, and the air was changed as many times in the hour as the size

of it permitted its exhaustion by the chimney-flue. A Mr. Tobin has since successfully applied this principle to the ophthalmic ward of St. George's Hospital, where there is no other means of heating than the fire, and no other extractor but the chimney-flue, resulting in good ventilation with no draught whatever from the semicircular wall pipes. At least this is a true account of it on the day I happened to visit the ward.

When there is no fire the aspiration by the chimney-flue is much diminished, but might be maintained throughout the summer by the use of a ring of gas-jets just over the mouth of the register. There are circumstances, however, under which this system is inapplicable, and the guidance of a professional man is desirable in all cases.

The Hygiastic School Board grates have recently been improved, and the fresh air (warmed in its entrance by passing under the iron hearth and fire-clay back) is brought in with a vertical current through the mantel-shelf instead of horizontally by the stove front, and rises to the ceiling and returns to feed the fire ; by this means the cold air is warmed on its entrance, which is not the case in Dr. Whitehurst's plan. In a similar manner a hall and staircase may be warmed by a coil of wrought iron hot-water pipes, heated by a small iron furnace in the basement, the fresh air passes through the coil and out at its horizontal grating in the top of its case. The pipes being filled with non-freezing solution, so that they may not be liable to accident by frost. In all these cases the admission of air is under control.

In the opinion of many, however, it is better to provide special extract shafts at the upper part of the room, and for large rooms and occasional gatherings, not to mention school rooms and long dormitories, the chimney flue is often insufficient. This is my own custom, as will be seen by the illustration of a sanitary house which I have attached to this paper. I usually add a gas jet just within the extract grating fixed just below the ceiling. This illustration will fully explain my views both as to the imper-

meable construction of walls and floors, and in respect to ventilation generally. I have contrasted a sanitary with an unsanitary house and shown how the drains should be constructed and ventilated as well.

Mica ventilators may with advantage be placed in the smoke flues near the ceiling, but in this case the admission of air must be opposite the fire to clear the rooms, and if the admission of air is to be at the bottom of the room then the "radiator ventilator" will be found useful in diffusing the air on its entrance, so as to avoid direct draught; both may be seen at the Parkes Museum. Gas jets may be introduced at the foot of the vertical ventilating shafts with great advantage.

Various systems of ventilating through the ridge tiles have been suggested and are to be seen in the Exhibition. The Eolus Waterspray Company have an ingenious mode of producing an inlet current by a vacuum formed by a water spray, which cleanses the air as it enters, and then passes it through a gas calorigen, pure and warm. Their church roof ventilator has been successfully applied by Mr. Bloomfield. I exhibit a plan of my own for ventilating and lighting hospital wards at one and the same time.

Cowls may be useful to prevent down draught, but must not be relied on for creating upward currents. The best cure for smoky chimneys is Billing's Throttle valve and terminal, designed by an architect, which is to be seen on one half of Somerset House. Why the other half is not done to match it, I can't tell you.

THE CONSTRUCTION OF CHIMNEYS.

By JOHN P. SEDDON.

CHIMNEYS, at present at any rate, are integral and important features of ordinary buildings in England. It may be that they can, and will ultimately be altogether dispensed

with, and our towns made, by the progress of economic science, to resemble those in the East—mere collections of flat-roofed boxes; and these may possibly be fed with fresh air of varied temperature, and drained of their fouled air, by some parish pump and common heating apparatus. When this scientific millennium arrives, such dwellings may be left to purely scientific men, to whom æsthetic considerations are questions of superfluity.

I have, however, now to speak as an architect, addressing a sanitary conference, upon chimneys as existent, and I wish to show how they can and should be treated, that they may be practically useful and ornamental as well. They have been both in former times; witness the graceful chimney shafts of Grosmont Castle, Southwell Priory, Hampton Court, and a host of Elizabethan mansions, the acknowledged picturesqueness of which is mainly due to the treatment of their chimney-stacks. Alas! however, they are seldom either useful or ornamental now-a-days; as a glance at the sky-lines of our streets will reveal, since they are almost invariably disfigured by ugly cowls and "tall-boys." These are but records of domestic misery and discomfort; every one representing a martyrdom, endured until it became intolerable; and their aggregate cost, amounts to a tax upon the inhabitants of our cities, which, were it an enforced one, might lead to a revolution. Yet the makers of such monstrosities occupy no inconsiderable space in this very Health Exhibition, and recommend their wares as palliatives for a disease which they assume to be not only universal but inevitable. I maintain that it is not the latter, and need not be the former, and that such costly and ugly excrescences may be altogether dispensed with, if but a little attention be given to the proper construction of these portions of our buildings—chimneys and fire-places.

Now let me ask, Why do our chimneys smoke? Firstly, because, as a rule, air is not laid on, or provided to houses, as water is; but rather, indeed, it is in general sedulously excluded. The more sanitarily impervious (that is to say,

air-tight) we make our dwellings, the more necessary it is to provide for the admission of fresh air to their interiors, and, unless this be done, smoke cannot ascend the flues of their chimneys; secondly, chimneys smoke because the fire-places are ill-constructed, and gathered over from the openings of the fire-places to the flues, in such a gradual manner as to leave large vacant spaces above the grates, which act as reservoirs for stagnant cold air, by contact with which the smoke is chilled, and prevented from rising and being drawn at once into the flues; thirdly, chimneys smoke because flues are ordinarily made too large (the usual size is 14 inches by 9 inches); they should rarely be made more than 9 inches by 9 inches; fourthly, because no provision is made in the flues for such down-draughts of air as may invade them, to expend and exhaust themselves before they reach the fireplace; and, fifthly, because the tops of the chimney-shafts are not carefully constructed with guards against wind in a proper and sightly, that is to say, an architectural manner. Usually all such provision is left to be supplemented by some miserable metal make-shifts, by the chimney-quacks, whose fantastic creations Dickens satirized so keenly, and yet, as it would appear even from this Exhibition, quite vainly.

As it is useless to expect that chimneys can properly perform their office, of conducting readily into the outer atmosphere the smoke from fireplaces, unless their construction is proper throughout, I shall treat of the fireplace, flue and chimney-top as a whole, of which the several parts are inseparably connected; and I shall begin at the bottom, with the fireplace, as the most important of the three, and the one most commonly in fault in the case of smoking chimneys, although it is generally the last to be noticed or examined with a view to its correction. The grate itself, however, I shall leave for later consideration, though it is by no means of the least importance.

The first thing to be done is to provide a good and sufficient supply of fresh air to the fireplace from the outside of the building. To ensure its being good it is well,

when possible, to bring this from as high a level as can be arranged, yet not from the top of the chimney stack, lest smoke from other flues be drawn down thence with the fresh air. It may be drawn from the lower part of the stack, just above the roof, by special air flues brought down the chimney jambs. This, however, is not always possible, and then it must be brought in through the walls or by pipes through the floors. An advantage of bringing the fresh air to the fireplace, rather than to any other part of an apartment, is that even if cold, it does not produce the inconvenient draughts usually complained of. It spreads thence upwards and gradually, before being finally drawn up the chimney by the fire in the fireplace; whereas, if admitted elsewhere, its passage is direct to the fire, and unpleasantly so to those who may intercept its course. When no provision for air is made, it has to force its way in at windows and doors, with the same result, made all the worse because of the low temperature at which it enters. The air, however, brought to this point, may be tempered or warmed by being made to pass around the grate before it is admitted to the apartment, and an essential for both comfort and health is that it should be so tempered; every grate, stove or heating apparatus should, in fact, be thus made the fountain or source whence fresh air is admitted to apartments.

The next point to be considered is that of the outlet of the smoke from the fireplace to the flue. The flue should be here contracted at once to its normal size or rather made a little smaller, immediately above the fireplace, in order to promote a quick draught of the smoke into it. The usual construction of this part of chimneys, already adverted to, does not conduce to this end. The opening of the fireplace is gathered gradually, in an arched form, to the flue, leaving an objectionable space for cold air. Now, arch and chimney bar may be economically dispensed with by forming a mantle block in Portland cement concrete *in situ*, extending the full width of the wall, and nine inches longer than the opening, and nine or twelve inches deep,

pierced with the smoke flue in the centre, and one for warmed air on either side. These may be circular, and about eight inches in diameter, and thus, being slightly smaller than the flue over, will ensure a quick draught to the smoke flue. The side holes are intended as outlets for the fresh air that has passed round the grates, and thus can be conducted by flues built above the mantle block to gratings for admitting it into the apartment, either in connection with the chimney-piece or just below the ceiling.

The construction of the smoke flue from above the central hole in this mantleblock is the next point deserving, and requiring consideration. As has been said, this is ordinarily made 14-inches by 9-inches, but this is too large, and as such becomes a frequent cause for smoking chimneys. Flues should not generally be made more than 9 inches by 9 inches in brickwork, and are better if lined with fireclay pipes within such, which reduces them to about 8 inches in clear circular diameter. The interior surfaces of the pipes should not be smooth, or else much inconvenience will be caused by frequent small falls of soot, from its being unable to cling to the pipes at all.

Midway between the top of the mantle block, and the ceiling line of the apartment, the smoke flue should have a portion expanded and formed in such a manner, as to break the direct line of ascent of the smoke. This is in order to allow down draughts or gusts of air, that have invaded the flues from the top, to expend themselves, without checking the smoke as it rises from the fireplace. A flat ledge should be provided in this expanded part of the flue, immediately under the smoke flue above, that air driven down may impinge upon it, and be diverted, and a sideways rotary motion given to it, directing it upwards again, together with the smoke rising from below. Specially formed pipes can be introduced into flues lined with fireclay pipes for this purpose, and more than one of these may be inserted in the course of the flues with advantage.

We now have arrived at the chimney-stack above the

roofs, and the principal object in its construction is to maintain throughout its warmth, as it is there, of course, exposed to cold and damp ; and it is well known and observed that those chimneys which are in external walls are, from this cause, far more liable than others to smoke. Pervious brickwork becomes saturated by rain, and the flues consequently reduced in temperature are unable to maintain the requisite upward draught. It is well, therefore, for this reason as well as for additional strength, that the chimney stacks above the roof should be built in cement instead of common mortar, and of impervious bricks or stone and lined with fireclay pipes.

The tops of the chimney stacks need careful arrangement, because the exit of the smoke from them is very liable to be disturbed and hindered by gusts of wind, particularly when beneath other high objects in the neighbourhood. There should, therefore, be at the top of every flue an expanded space, within which most down draughts of air will rotate and expend their force without invading the flue below ; and there should be louvred openings so arranged as to direct the wind upwards, and so make it to assist, instead of interfering with or retarding, the exit of smoke. This is the object generally and often rightly attempted by the supplementary cowls, at any rate by the best of them, but it may and should be rather executed in proper architectural form, and durable and sightly materials, such as stone, brickwork or terracotta, instead of metal. Terracotta is perhaps specially suitable, as being very easily manipulated into the somewhat complicated forms required for the purpose.

So much then for the construction of these three parts of a chimney—the fireplace, the flue, and the chimney terminal of the stack. Unless all are well and properly executed, no special appliances for particular parts can be of much avail. I have endeavoured to point out the general principles that I think should be attended to in connection with them, and believing that the health and comfort of the community is at present very injuriously affected by

their general neglect, I earnestly commend them to the consideration of this Conference.

There is, however, one more part connected with the chimney which is perhaps quite as important as any of the rest with which I have dealt, but what I have to say about it is somewhat more tentative and experimental. This is the grate within the fireplace. Volumes have been written about it, and yet it remains open for discussion and inviting improvement. My contributions to its literature will be short, and yet it will embody the result of much time and thought expended upon it.

Burning coal principally, as we do in England, we have to seek in the consumption of its smoke, or at least of as large a proportion of it as possible, within the grate itself, the solution of the main difficulties we are considering. For the smoke being consumed, smoky chimneys will be cured. The office of the flue will then be to convey away the gaseous products of combustion only, and not soot. This is, I believe, attainable by means of diverting the current of the smoke after it has issued from the top of the fire, in such a manner as to force it to pass through the body of the fire, before it ultimately is allowed to escape up the chimney flue.* Perfect combustion is, I think, more to be sought than what is called "slow combustion," and it is a mistake in my opinion to smother a fire in its own ashes, by preventing their dropping through a grating into an ashpan. The cheerful aspect of an English open fire is not likely to be driven out of fashion by even Health Exhibitions ; nor if it could be, and the attempt were made, do I think that the public salubrity would be improved by the substitution of any description of close stoves in apartments, notwithstanding the preference they have obtained on the Continent, and to a great extent in America. Nor do I believe that any of the systems that have been proposed for keeping up throughout dwellings an equable temperature, are likely long to curtail the liberty of English

* In some stoves in this Exhibition it is carried through heated asbestos blocks, which is an attempt in the right direction.

subjects to make their several rooms of whatever degree of heat it may please their occupants. I should certainly therefore not advise the most ardent believer in such a system to expend capital in building houses otherwise than as at present in this respect, or to try to dispense with chimneys, the construction of which I have been dealing with.

But there are many grates shown in this Exhibition which presume fresh air to be brought to them, and in which means are provided for warming and distributing such air into apartments, and I cannot too highly commend the system, and advise its universal adoption by the public; and I may point out that this can and should be done, more often than it is, in the case of the kitchen chimney, which is almost always in use, and that the air warmed thereby, not being wanted in the kitchen, should be conducted to the general hall of the house, which supplies air to the rooms whenever their doors are opened, though of course there should be means of shutting it off in summer, when it might prove rather a nuisance than otherwise.

Trusting then that soon, if it be not already achieved by any of the grates shown in this Exhibition, that most desirable end, the consumption of smoke within the grate itself will be successfully carried out, I conclude these few observations upon the construction of chimneys, waiting discussion thereon, from the members of this Conference.

DISCUSSION.

Mr. CHAS. FORSTER HAYWARD, F.S.A., referring to Mr. Hunt's paper, read on the previous day, in which reference was made to the absence of sufficient windows in old houses, particularly for light and air to water-closets, pointed out that at that time the window tax was in operation, which was no doubt to a great extent the cause

of the evil referred to, and had a most detrimental effect on the building of that time. He then proceeded to read the following paper which he had prepared :—

The advantage, not to say the *importance* of having such parts of dwelling houses as floors, roofs and walls, constructed in a manner so that they may not be too open to the influences of atmospheric changes, might at first sight appear clear to anyone, but still this point enforced in the paper just read having special regard to ventilation, is one well worthy of discussion, connected as it necessarily is with the second paper which refers more particularly to another detail of construction so essential in this country and climate, not only to comfort, but to the possibilities of scientific ventilation, viz., the construction of chimneys and flues. Our point then is to discuss the effects of permeable *versus* impermeable, porous *versus* impervious construction, as applied to certain parts of dwelling houses.

First then let us ask, impermeable to what? I reply (1) to *Air*, bad or good, including cold and heat, and (2) to *Water*, including damp and rain. If time permitted these two aspects of the question might well be separately treated, but merely hinting at the ideas expressed by Pettenkofer and others as to the extent to which walls are permeable to air, we may at once say that if we would ventilate scientifically, and in any but the most simple and elementary manner, we must have the walls and floors impermeable to the atmospheric effects as generally expressed above ; and obviously the introduction of wet or damp through the walls would greatly militate against any means employed to ventilate. Impermeable floors in the basement are best secured by asphalte in some form, either as a thin layer on concrete with a smooth surface, or as a bed for wood-block flooring or other such, as small joists bedded in or on the asphalte to which joists the flooring may be nailed. Other substances of a similar if inferior nature may be used, such as cement, &c. Impermeable floors above the basement or ground level are

obtained by the use of rolled iron joists and concrete with asphalte or cement covering, or perhaps with a wood surface as before. But even wood-block flooring requires care, especially in laying, and if this is done carelessly in cement, the result is an accumulation of dirt in the joints and loose flooring requiring to be relaid. In one case, however, I used, say twenty years ago at least, some wood blocks, bedded in substance like asphalte for a very damp basement, and this has stood perfectly, and a similar floor (a French patent) has best borne the wear and tear of an entrance doorway for ten years, while the wood-block floors of the same house laid in cement have come to pieces.

In speaking of these iron and concrete upper floors we rather touch upon the fire-proof construction question, so we will only refer to modifications of these impervious floors, such as wooden joists filled in with concrete pugging and finished with a surface of tiles or cement. This I have often used for school passages where *fire-resisting* material is sufficient in opposition to *fire-proof* construction. I will only refer incidentally to the old-fashioned plaster floors of Nottinghamshire as being of this character. It is obvious that in these impervious floors one must give up all the contrivances for ventilation *through* the floors, and omit all calculation as to air finding its way into the room through the joints of the flooring charged sometimes with the dust of carpets and other objectionable matter. Also all need of air brick ventilation for the floor itself to keep away dry rot, &c., is avoided. This construction, however, might be rather better, if so arranged, for laying pipes therein to bring air to the fire or other parts of the room, as it is more rigid than ordinary wood-joist floors.

Passing this we come to the *walls*, which are obviously imperfect if built of porous material, whether of brick or stone, or with imperfect joints, or without damp courses, both vertically and horizontally, both in basement or below the ground level, and in chimneys above the roof where necessary. Hollow walls are well known as expedients which require careful work and some experience to make

effective. Even all the galvanised iron ties twisted and bent upwards, and the patent glazed bonding are not enough unless care be taken to prevent lodgment of lumps of mortar during construction, so that in building hollow walls a space for raking out these below is best left to the last. Then the jambs of windows are difficult to manage, and other points require attention, but it is certain that two walls half-brick thick are better than 9 inch solid wall to resist wet, &c., and that a stone outer construction should generally have a lining of brick a slight distance from the inner stone face, to secure an impermeable wall; but the best of all as against wet, though not always as against wind and draught, is vertical external covering of tiles or slates. The former obtains in such districts as Surrey, the latter in Cornwall and elsewhere. The use of such substances as Hygienic rock-building composition for lining walls, or in place of mortar for the joints, is obviously valuable in certain situations, and has frequently been used with success (in the shape of asphalte) where dry areas, &c., could not be employed, or as a coating internally for hollow walls to prevent access of damp and weather, but of the substances advertised for coating walls externally little may be expected, and less for those often advertised as being certain specifics against damp. Certainly I should not think of such as affording means for constructing what we call impermeable walls. Roofs may be made as impervious as floors, and when so made would be better flat or horizontal without any steep slope. Yet for ventilation purposes a flat roof is not an unmixed advantage, as it implies the omission of a body of air space frequently made available and very convenient; but for access to chimneys or roof ventilators a flat is obviously very desirable. Sloping roofs, however, may be made practically impermeable, so this matter need not detain us.

Now to ventilate and warm a building, and seeking how best to utilise our impervious constructions, we must remember that we have, first, to feed human lungs; secondly, the fire in the room. When warming is not

required only human beings have to be thought of, but still, even then, the chimney may be of great use, or at any rate if it exists it cannot be ignored in any system of ventilation. Ingress of fresh air is best secured where practicable, by such tubes and inlets as are called Tobin's (a convenient, though inaccurate name for them), because they can be regulated in height, and size, and position, and by small valves or doors; they can also be placed regularly round a room away from an outer wall, connecting tubes being laid in the floor. The same arrangement of pipes laid or bedded in the substance of the floor can be adopted to feed the fire, either at the hearth or at the cheeks and jambs, and in the same way air can be brought to the back of stoves—if in suitable positions—to be warmed and distributed in the room or others adjoining.

Hollow channels in the walls, or portions of hollow walls can be used, and I have adopted this plan for ventilating a large building at the window cills which are more than the usual height from the floor. Additional air can be obtained under regulation from the space over the door, as in school corridors, but I have built one little house supplied with air only in this way, and by special ventilators in the mid-rail of the door itself—a necessity in one case, where the occupants were workwomen who would not have the doors opened, fearing cold feet, and draught. These and various other means are, of course, supplementary to the natural ventilation of doors and windows, and the object should be to bring in sufficient change of air without draught. For the egress of vitiated air the ordinary chimneys come into use, whether a fire be lighted or not, but special ventilating flues near to some other flue that is generally in use are best, with a gas jet to create a draught upwards when required, but if the room be properly supplied with fresh air there will be little tendency for a down current, as is so frequently the case even with special upcast ventilators.

If it were congenial to our ideas of comfort, the con-

tinental tile stoves, with tall flues going right through the ceilings of the room, would afford egress, or might be made to assist greatly in the ventilation by affording ready channels of egress for vitiated air, being conducted by the side of the flue into some adjoining chimney or other ejector through balanced talc valves. Failing this, however, for ordinary apartments we use the ordinary flue.

Now the sum and substance of all this seems to be a strong recommendation to the householder to insist, and therefore to pay what is necessary to procure, good impermeable walls, floors, and ceilings, if he would have good ventilation, combined with warmth and comfort, without draught. I may add that such floors are being carried out now in my neighbourhood of Bloomsbury for very moderately rented houses and flats, as well as for workmen's dwellings, and are found to pay well for this improved manner of construction.

Mr. RALPH NEVILL, F.S.A., said that Mr. Robins, in the experiments in which he had forced air through brick and stone, had omitted a most important feature, viz., the plaster on the wall and the paper. Everyone knew how cold walls were until they were papered, and that it was in fact the paper which kept the room warm, and he thought that very likely if the brick or stone were covered with a coat of plaster, and then papered, there would be a very great difficulty in forcing the air through. Besides this the force used was an exaggerated force, for even a tempest would never have sufficient force to blow through a wall in such a way as to blow out a candle. He rather doubted whether altogether it was a disadvantage for a wall to be permeable, at any rate the experiment was worthless except under such conditions as prevailed in every ordinary house. The question of roofing was a very important one, and they had not yet arrived at the best way out of the difficulty. Many persons would not admit that it was a difficulty, or they would not pay for having the difficulty cured. One great objection to felt was that you could not be sure it would not smell, and he had known instances where a

roof had to be stripped and the felt taken away for that reason. With regard to chimneys he was interested to hear Mr. Seddon say that 9 × 9 was a better size than 14 × 9, for his experience in the country had been rather the opposite, having found more difficulty from chimneys being too small. Possibly Mr. Seddon's plan might work very well if a large current of air were brought in at the foot of the fireplace, as proposed, but that seemed to him of very doubtful expediency. There was great danger of its being stopped up by the first occupant of the house, and if that were the case, a 9 × 9 chimney shaft would not be big enough. It might almost be taken for granted that people would stop ventilators, however they were arranged, and it was necessary to provide against that. Down old chimneys there was a considerable flow of cold air, which generally came down the sides, whilst the smoke and hot air went up the middle. With a shaft of 14 × 9 there was room for both currents, but 9 × 9 was only large enough to take up the smoke, and the consequence was the hot smoke was brought in contact with the cold stones at the edge, and ran a great risk of being so chilled, that it lost its power of ascending and there was no room left for any cold air to come down. It also appeared to him that the little shelves recommended in the chimney shaft would be simply soot traps.

Mr. WILLIAM WHITE, F.S.A., said, some of the points brought forward were no doubt questions of difficulty, and at present there was by no means an agreement as to the best mode of meeting them. For instance, with regard to the size of chimneys, he was inclined to think it was not so much a question of size as whether the flue was properly constructed, properly air tight, properly pargetted, and above all having spaces for the reception of the down current of air. The size of the throat of the chimney was of great importance, and he maintained that it ought to be, as Count Romford said, "narrow and wide," not square. There should also be a cavity above the throat which would create a vacuum for the draught. The flue should be

impermeable to the air and wet, both of which were of equal consequence, and it was essential, therefore, that it should be constructed either of impervious brick, or that there should be an impervious washing over the brick. Some people perhaps would hardly believe that on the south coast he had seen, at the inside end of a 9-inch brick, water bubbling through with the air on the occasion of a storm. One of the greatest difficulties in the construction of chimneys was the slovenly manner in which bricklayers did their work in not filling the side joint. It was the greatest difficulty to get the side joints filled, simply because the men did not know the necessity and reason of it. With regard to felt under roofs, he had known cases where asphalt felt had to be removed on account of mildew, and dry rot which it created. The contact of the felt itself being impervious with the inside boarding, which had been varnished or oiled on the outside, had created a fermentation which had produced mildew and rot. He had been trying to obviate this by substituting Willesden paper for felt, and he found it very excellent for the purpose, although it was not, of course, such a non-conductor of heat and cold as felt. He thought all basements, and groundfloors where there were no basements, ought to be laid in wood block flooring. But then there was the same necessity for the entire impermeability to moisture, or else dry rot would ensue. One method of rendering a floor impermeable, which had been recommended by Dr. Richardson and others, was to turn an arch over the whole floor space under the building, so as to provide for perfect ventilation, but that plan, though very excellent, was very expensive, and could not often be adopted. Still, in cases where it was of the greatest consequence that no ground air should be introduced, that was perhaps the only proper course to follow. He had found the wood block flooring more durable than Staffordshire paving, for in some schoolrooms, which were laid with wood block flooring, the passage outside which had been laid with 6 inches of common Staffordshire metallic tiles, these tiles got so worn

that it was necessary to take them up in the course of five or six years and re-lay them with wood blocks.

Mr. E. W. C. F. SCHMIDT wished to ask Mr. Robins a question or two on the testing of materials with air, the result of which seemed rather startling. He should like to know if he had tried the experiment on ordinary hollow walls, with a 4½-inch wall inside, and a 9-inch wall outside, and also whether he had tested it with a wall cemented outside. With regard to the ventilation of rooms, they found in Eastbourne, that the "Tobin" system, of having boxes in the four corners of the rooms, and also perforating the centre ornament, kept the room well ventilated, especially in the evening, and there was no trouble with it at all.

Mr. R. A. MACFIE suggested that Mr. Robins should publish his experiments, with a diagram, in one of the Professional Journals, so that people throughout the country might amuse themselves by repeating, and varying the experiments.

Major ROWE (President of the Institute of Architects, Sydney) said he found the same old questions were still being raised here in England as architects on the other side of the water had to discuss, that he had the pleasure of practising in Sydney, Australia, for about twenty-eight years, and there they had the same difficulties to contend with, and in some respects greater, not having the same variety of materials to deal with. For keeping the outer walls damp-proof they relied, to a great extent, on the use of cement, which seemed to be not much used in England. They found there the bricks would not keep out the weather, for although the climate was comparatively dry, when it did rain, it poured, and sometimes blew very hard, being a semi-tropical climate, and therefore common stock bricks were perfectly useless to keep out the weather, and the walls would be wet through in a very short time. Cement, therefore, was mainly used for ordinary purposes, but even that was not always found successful, in consequence of inferior materials, and its being put on too slightly.

When a building was not under the control of architects, it was put on about three-eighths of an inch thick ; and although labour was 12*s.* a-day, it was put on as cheaply per yard as it was in England. That was the reason it did not resist the weather, for whenever it was faithfully mixed in fair proportions, and put on in fair substance, it resisted the weather very fairly. They had glazed and compressed bricks in Sydney, but their cost was too great to allow of their being used to a very large extent. He himself had experimented on the absorption of different materials to ascertain the amount of water they would absorb, and the result was that the sandstone which was used for buildings resisted water considerably more than the common quality of brick. They had no limestone in Sydney, and Sydney was principally built of sandstone. It was a magnificent building material, and the principal elevation of all the street architecture was built of this material ; it had a beautiful tint, and a few months after it was put up resisted water fairly well when the surface became slightly hardened, as it did after a certain amount of exposure. Upon looking at the diagram which Mr. Robins had shown, of his improved mode of building, he was much in favour of it for resisting the weather whenever it was desired to preserve the natural effect of the brick, but it would be certainly cheaper to build hollow or solid walls, and cement them outside. In Sydney it would not do to use flags or tiles for the basement floors, as the servants objected to it causing rheumatism ; but he thought the "Ebner" plan, which Mr. Robins had shown them, would be excellent, he himself had noticed it in the Exhibition. As to flues, he had made them of all sizes, but he doubted whether 9 × 9 was the right thing, and was rather inclined to think that 9 × 14 was better for ordinary chimneys, and in large hospitals or other buildings, where the fireplaces were necessarily large, he had made them 2 feet square.

Colonel PRENDERGAST wished to say a word or two on the latter half of Mr. Robins's paper. On the previous day Sir Henry Acland had told them that thirty-five years

ago, in Oxford, people thought it was a conspiracy of the physicians when they talked about ventilating the pipes belonging to water-closets, and things of that kind, but now the whole of this Exhibition was full of means to avoid sewer gas. But there was a poison just as dangerous, and more subtle, and one which they seemed to think very little about, namely, vitiated air in living rooms. So little did the public think about the question of ventilation, that we who had had the arrangement of these papers were obliged to smuggle in that subject at the tail end of another. He, therefore, wished to say a word or two on the ventilation of rooms, for he was convinced there was no mode of ventilating houses properly except by ventilating each separate apartment by itself. All methods of ventilating a whole house by a continuous process were a delusion, and he regretted, therefore, that previous speakers had seemed to ignore the first principle in this matter, which was to draw off the vitiated air from the top of each room. They had heard nothing but eulogy of Mr. Tobin's principle, but valuable as it might be for diluting the poison, it brought the air down again into the room to be breathed over again. He assumed, as an axiom, that the vitiated air should be drawn off from the top of the room, and he thought it was not out of place to implore the profession which was largely represented there to-day, to make some provision when planning new houses so that at some future time arrangements might be made for drawing off, through previously constructed channels, the vitiated air from the tops of the rooms. He was not sufficiently practical himself to know what this would add to the cost, but he could not see why, when a specification was drawn, a few channels here and there should not be put in for this purpose. It seemed to him a very simple process, and one which it was their duty to turn their attention to. Then the question arose, what were they to do in houses such as they now lived in? Mr. Robins wisely suggested the use of a flue, but he did not tell them, what was of the highest importance, that you should not use the flue of the room in which you were living, but

should preferably use the one which happened to be near it. All complications should be got rid of, and things made perfectly simple. One simple means of admitting fresh air should be universally adopted, and that was to make the bottoms of window-sashes very much deeper than they usually were, which would allow of their being raised an inch or two, to allow the passage of air between the upper and lower sash. In all arrangements for ventilation, machinery, and, above all, metal work, should be avoided, because anything that corroded got out of order. To prevent down-draught from ventilating flues, mica plates might be used with advantage.

Mr. ALFRED WATERHOUSE, A.R.A., said he was surprised that no one had alluded to a singularly simple way of getting rid of vitiated air from the upper part of ordinary rooms, which had the advantage of being "self contained," that is to say, it did not require the complicated system of using the flue of another room to clear away the vitiated air from the occupied room. He believed the system was at one time patented, but he could not remember the name of the patentee. It simply consisted of making a flue down the chimney breast, and turning it into the smoke flue, just above the chimney bar, having an inlet of course near the ceiling. The action was perfect, for he had tried it in his own house, and never found a particle of smoke come out of the opening at the top of the room. The ventilating flue might be called the short arm of a syphon, and the smoke flue the long. The action, however, depended on the heat of the fire drawing the air from the top of the room down the short arm and up the flue.

With regard to the floor blocks, he thought that they might be used with advantage, not only on the basement or ground floors of houses, but also on the chamber floors. A floor of that sort laid on fire-proof construction got rid of the dust trap which the space between the plastered ceilings and ordinary boarded floors inevitably became. He was now planning a house for an eminent physician, who insisted on the abolition of every wooden joist in the

house, as he would have no vacant space between the ceilings and the floor above it.

Mr. BRADSHAW (Bolton) asked Mr. Robins when making the experiments he promised, if he would at the same time make one with an empty box, when he did not think the candle would be blown out much quicker. The air seemed to go through with such marvellous rapidity that one did not quite believe it. With regard to placing composition in the cavity of walls, he had tried filling in with portland cement, but that did not answer very well, for the capillary attraction allowed the water to come through. He had now tried filling the cavity with bitumen, or, as it was commonly called, asphalt, and that answered to a certain extent, but was always open to this objection, that if the workmen in pouring it in did not take great care to have all the air extracted, cavities were left which always allowed an apparently excessive amount of moisture to come through. Mr. White's composition had not been in use so long as to be generally tested, but he thought it would be open to the same objection that carelessness or inattention on the part of the workmen would allow air spaces to be left and moisture would come through and spread on the inner face apparently much out of proportion to the size of the apertures. He must confess to have doubted the desirability of making walls perfectly impervious. One plan he had adopted had been to slate the inner face of the cavity wall in much the same way as the outside of gables are slated, and he found that answered perfectly to keep out moisture, and made the house very much warmer. At the same time there was another objection to an impermeable wall that it made the room into a perfectly closed box, and every drop of moisture in the room had to condense either on the floors or on the walls where it streamed down, as it did on the surface when the walls were painted inside. He had therefore come to the conclusion that the best thing was not to exclude the air, but only the wet. With regard to having flues under the floors of basements to conduct away the ground air, he feared in practice

those would make capital runs for rats, and trouble might occasionally arise from their dying in them. With regard to Mr. Seddon's suggestion, that chimneys should be lined with pipes, he would remark that that was expensive, and in the north, where they used rather more coals than was usual in London, they were open to another objection, because occasionally chimneys were not swept and caught fire, and when such was the case the heat cracked the pipes to bits, for ordinary sanitary ware would not stand fire. With regard to the size of 9 in. × 9 in., if such a flue were put to a kitchen fire, it would cause a roaring draught, but he was rather surprised that the relation of the size to the length of the flue did not seem to be considered. A very tall flue would bear a larger section than a small one. He had also agreed with the observations which had already been made, that the ledges Mr. Seddon recommended would act as soot traps, for he had noticed that wherever the gathering of a chimney flue was at all flat and there was a high length of flue above it, the soot fell upon it and lay there, and the damp struck through on to the plaster of the room. At any rate there would be the disadvantage that as the soot fell on this ledge it would form a natural slope, and the supposed check to down draft would be of no service. With regard to the flat roofs, he might remark that every now and then we had a really good old-fashioned winter, and occasionally there might be some twelve inches of snow or more upon them, and persons who had been so circumstanced as to have a large lead flat over a part of their residence had found that they had occasionally to spend a Sunday morning, or perhaps some more inconvenient season, in getting up to the roof and shovelling off the snow.

The CHAIRMAN said they must now bring this portion of the discussion to a close. There was not time even for some observations he had desired to make, and in the absence of Mr. Waterhouse, who had been obliged to leave, he would ask Mr. Ewan Christian to take the chair for the remainder of the sitting.

SUGGESTIONS RESPECTING DOORS AND FIRE-RESISTING CONSTRUCTION.

By HORACE JONES.

A CONSIDERATION of many of the unhappy occurrences during the terrible catastrophe of fire within my own memory has induced me to formulate "A Suggestion with regard to the Construction of Doors so as to afford opportunity of Escape from Fire." I append a list of the more prominent cases in which, by the newspaper accounts, some 5,000 lives are alleged to have been lost. Supposing this is somewhat exaggerated, and there is only one-half or even a fifth of that amount, it will still be a horrible and terrible tale to record against the builders and designers of public buildings.

Amongst those to which my attention has been more especially drawn, I may quote the following, viz. :—

1807. Oct. 15. Sadlers' Wells Theatre. — Eighteen persons trampled to death from a false alarm of fire.

1845. May 27. Haggett's Hotel, Dover Street, Piccadilly.—Several eminent persons perished.

Exact date unknown, but about 30 years ago, a whole family were burnt or suffocated through not being able to open the front or street door during a fire, not far from the Marble Arch.

1858. Dec. 27. Coburg (now Victoria) Theatre.—Alarm of fire. Sixteen persons killed.

1863. Dec. 8. Santiago (Church of the Campaña), capital of Chili, South America.—About 7 p.m. The feast of the Immaculate Conception of the Virgin

Mary, and the last day of a series of religious celebrations, in the month of May. The church, when brilliantly illuminated in a dangerous manner, was burnt down, the fire beginning amongst the combustible ornaments, and above 2,000 persons, principally women, perished, the means of egress being utterly insufficient.

1866. Nov. 5. In Hampstead Road.—Thirteen lives lost.

1878. Feb. 4. Circus at Calais Fair.—The loss of life was mainly owing to the supplemental door, for escape in case of accidents, *opening inwards*, becoming blocked. Twelve dead and others not expected to recover.

1878. Oct. 11. Colosseum Music Hall, Paradise Street, Liverpool.—Thirty-seven persons dead and several seriously injured. No relief until the police cut away a partition forming a barrier which divided the stream of people entering towards the different parts of the auditorium.

1881. Dec. 8. Ring Theatre, Vienna, formerly Opera Comique.—Total destruction of building and loss of life variously estimated at from 500 to 900 persons.

1883. Jan. 10. New Hall House, chief hotel of Milwaukie.—Fire. Ninety lives lost.

1883. Jan. 13. Fire at Berditzcheff, a town of Russian Poland, in the Government of Kieff, in a circus.—The building in a few minutes was a mass of flame, and 1,500 persons perished.

1883. June 14. Victoria Hall, Sunderland—Death of 183 children. Probably caused by a bolt slipping into a socket in the floor.

I have had copies of the newspaper accounts made, which give in more detail the fearful occurrences. I have alluded especially to the one at Santiago.* It would, however, occupy too much time for me to read them through just now, though anyone can do so as they are on the table for inspection.

* See Appendix, page 260.

Such, then, are the reasons which prompted my "suggestion"—a suggestion, applicable to the large doors of churches, theatres, concert rooms or other public buildings, also the street or entrance doors of mansions, hotels, boarding-houses, or any other place where numerous inhabitants are likely to be in occupation ; also to the subsidiary doorways of public buildings, which are only to be in use either for egress under special circumstances such as panic or accident, or for ordinary egress.

The models, let me observe, will show far better my ideas than any description in words, but I may as well describe while you inspect them.

I will first take the wainscot, one which may be assumed to be about one-fourth or one-fifth the full size, or say about 4 ft. 6 in. wide, and nearly 8 ft. high. It represents an ordinary door to a large house, or a fair-sized hotel, and nothing is indicated on the outside excepting a six-panel door opening inwards, as doors of this description generally do ; an alarm of fire occurs, the people on the inside having rushed down to this, their principal mode of exit, and in their panic and desire to get out, block the door, either with their own bodies or pieces of furniture which they are in hopes of saving (something of this kind no doubt occurred in the large house at the Marble Arch, already alluded to) ; but if the unfortunate victims crowding and blocking the door with frenzied fear but not unnatural panic, found suddenly that this blocked door, opening inwards upon them, had a means of safety in itself, by simply opening outwards the folding wicket framed within the door, their chances of escape from almost certain destruction would be very much enhanced, and their thankfulness can be better imagined than described.

Of course if the height of the door admitted it, the upper panels would be framed solid, the wicket opening and shutting to and from the transom only.

The painted and grained model shows a somewhat similar door, only instead of a folding wicket it has only a single door, and would be peculiarly applicable to such

cases as that headed the "Circus at Calais Fair," where, according to my information, the deaths occurred through a subsidiary door opening inwards becoming blocked by the people from the circus in their panic-struck efforts to seek egress.

I would here observe that the cost of the extra labour in forming doors with these wickets, as shown by the model, would not be very large, a very small percentage upon the cost of an ordinary door being sufficient; the principal expenditure, of course, would be in the additional hinges and fastening, although the latter could be of any kind, from an "Espagnolette" bolt down to barrel bolts or bars. They would, of course, open only from the inside, and either by sealing or other methods ensure detection where they had been unnecessarily tampered with.

I have no doubt, in fastenings, &c., &c., some of the ingenious minds whom I have now the honour of addressing would readily find, if they think this is a suggestion worthy of attention, some improvement.

I would also admit that wickets are often applied to large doors or gates; these wickets are, however, very small, very inconvenient, and generally open the same way as the gates.

I will now proceed to call your attention to a form of construction, or rather an application of the different qualities of two of the best-known and most universally-used materials.

Some years ago I had occasion to visit an engineer's workshop or factory, that had been then quite recently destroyed by fire—indeed, the ruins were still smoking—and these shops consisted principally of two or three rather lofty storeys. A curious circumstance immediately presented itself: the beams or girders were composed generally of three distinct kinds, viz. cast iron, wrought iron, and timber.

I found that all the cast iron girders, of which there were several, on the ground, broken in pieces; the wrought iron laying, or rather hanging, from the upper floors, twisted

into various shapes; the wooden joists generally entirely consumed, nothing but some small remnants of charcoal indicated where they had been; but there were two wooden beams, which, for some special reason had been cased on two, and perhaps in some parts on three sides with thin iron plates. These beams alone remained *in situ;* both were well laden, and supported heavy and massive articles.

I inferred from this, that the application of the thin plates to the sides of the timber, prevented the combustion of the timber, whether by preventing the atmosphere getting at the fibre of the wood or from any other cause is immaterial as long as the result is the same.

As a proof to myself and the Engineer whose premises were burnt—he tried the following experiment, viz.:—selecting two or three pieces of ordinary timber, about 6 or 8 feet long, and say 6 by 4 inches scantling, and covering half their length with thin iron, bolted through on two sides. He had them placed in the furnace of a steam engine; in a short time the uncovered or unprotected wood, was entirely consumed, the parts protected had the sides charred, of course, but the middle of the scantling, desiccated thoroughly, yet quite sufficiently firm and solid to carry nearly if not quite its original load. Acting on this information, several floors were executed, as follows, for instance in the Sovereign Life Office, corner of St. James Street and Piccadilly.

The British and Magnetic Telegraph and Submarine Station, at the rear of the Exchange, Threadneedle Street.

One floor in each, dividing portions of the building separately occupied; some warehouses also for the storage of valuable goods, &c., &c.

Of course the progress of improvement would naturally adopt some of the many useful and ingenious modes of constructing fire-proof floors, such as using rolled iron joists quite covered or embedded in concrete; but there are times when a different mode of construction may be advisable

and the application of a useful beam of wood rendered fire proof by the thin covering of iron not be neglected. Of course the embedding in concrete of iron, will also apply to wooden joists without the protecting iron case, and if so, an economy will be the result. Few Fire-proof floors can be constructed under £6 or £7 per square. I am, however, informed of one in which the constructors claim they can construct it at £5 16*s.* 9*d.* per square.

I have enquired of a respectable and well-known surveyor the ordinary cost of ordinary flooring. His letter is as follows:—

10, South Street, Finsbury, E.C.
4th July, 1884.

DEAR SIR,

We have carefully estimated in detail the cost of the fire-proof flooring according to and as shown by your section, and we find that for a room of say 24 feet by 16 feet the cost will be £4 10*s.* 6*d.* per square, being about 7 shillings per square less than an ordinary floor construction, with fir joists 12 in. apart, $1\frac{1}{4}$ in. yellow deal flooring, 2 courses of herring bone strutting, and lath and half and plaster ceiling.

If instead of the floated surface a $\frac{3}{4}$ in. deal floor laid on thin tar is substituted, similar to some which we recollect being laid by your directions some ten years ago, and with which we believe there has never been any complaint as to vermin or rot, there would be an additional cost of about 14*s.* 6*d.* a square.

We estimate the cost per square of the floor as per section at £4 10*s.* 6*d.*, or with boarded surface at £5 5*s.* a square. This particular flooring is lower in price than the usual fire-proof floor, but upon its durability or other advantages it is not, as you intimated, our province to offer an opinion.

We shall be happy to give any further information or details upon the matter.

We are, dear Sir,
Yours faithfully,
WILLIAM REDDALL & SON,
Estimating and Quantity Surveyors.

I have also placed in his hands a sketch of the same idea,

but cheaper and doubtless not so perfect—but sufficiently useful to be often used.

I also think that the wire-work, in lieu of Lathing, as presented by Mr. Stent, of New York, and of which there is a model or specimen here, might be usefully applied to some of the ordinary floors, giving them some additional immunity from fire.

This question is, however, so serious and important, and so many men and so many minds are engaged in solving the many difficulties of the subject, that I am content to have started it, and now leave to the many eager and intelligent advocates of the various systems and theories, an enumeration of their views.

APPENDIX.

TERRIBLE CATASTROPHE IN CHILI.

(*From a private letter.*)

Santiago, *Dec.* 17, 1863.

A dreadful accident occurred in Santiago on the 8th inst., which has plunged the whole city, and indeed the whole country, into mourning. Two thousand human beings, principally women, perished by fire on that day, and were consumed in the short space of a quarter of an hour, without receiving assistance of any kind, or rather because it was out of the bystanders' power to afford them any help.

The 8th of December is in Catholic countries a great feast day, being the anniversary of the Purisima Concepcion of the Virgin Mary. During the previous month the Church de la Compania, so called because it belonged formerly to the Jesuits (Compania de Jesus), had been celebrating the devotional practices and offices that correspond to the Mes de Maria, a copy or imitation of what

at the same period of the year takes place in French churches. The month ends on the 8th of December, or the Feast of the Conception of the Virgin, and on the evening of that day the church was to be illuminated and adorned with flowers and garlands with more profusion than on former evenings. I may mention that many who had visited this church on former occasions had complained of the suffocation produced by the great agglomeration of people, and especially of the danger likely to be incurred by the great number of lights on the principal altar, and, indeed, all round the church, but it seems no measures were taken to prevent a serious accident. The church was capacious enough to contain, in my opinion, 3,000 women packed as they are in these countries, sitting and kneeling on the floor of their own hand carpets which each lady carries with her. Besides those who could accommodate themselves inside (for which purpose many took their seats outside the church three hours before the doors were opened) nearly 500 were left outside, sitting on the steps of the church near the doors, and just close enough to hear the music, or catch a few stray words from the preacher.

On the 8th being a feast day the devotees were exceedingly numerous, although, perhaps, a great many ladies preferred going to the Alameda, or Avenue of Poplars, which is the grand promenade, but on the other hand all the servant girls in town reeceived permission to attend. The doors of the church opened at 6 o'clock (or near that time), and the women took their places, each one scrambling as usual for the best, or that nearest the pulpit and principal altar. The servant boys (or lamplighters) commenced lighting the lamps; unfortunately they were not fed with oil, but with camphine, or as it is called here "gas portatil." The principal image of the Virgin in the centre of the altar was supported by a fine half moon of crescent or brilliant lamps. On lighting these an accident took place (the details are not known or well investigated), the fire communicated to the other surounding lamps to the artificial flowers and garlands, candles, &c.

Either the people inside the church did not perceive the fire, or the great part thought it might be easily extinguished (as on previous nights it was not uncommon to see the lamplighters blundering in their task), or some may have thought it best to wait, and may have been unwilling to lose their places. Meanwhile the fire had extended to the roof, which was of wood, and to the dome, also of wood, and the spectators began to perceive the danger they were in. Many left the church quietly, but in a few

minutes the greatest confusion prevailed. The 3000 inmates of the church ran to the doors. The building has three large doors in the front, but only one, the centre door, was available; the others were always closed and never made use of. The two side doors of the church were also available, but the chief number ran to the principal or front door, and the side door that opens on Bandera Street. The other side door opens on a small court, at the side of the new Congress, a building yet unfinished.

About a third of the congregation it appears managed to run out and escape, but the rest of the women fell upon each other at the very doors, and instead of opening a passage to let others escape formed a complete wedge, and the bodies remained locked together in rows one upon the other, these masses becoming every moment higher and more compact, and none being able to extricate herself as she was fastened or caught hold of by a dozen hands behind her. You can imagine the shrieks and agonies of these poor creatures struggling for life, and endeavouring to escape from the middle of the church, where the fire had already taken possession of the dome, and where the lamps and chandeliers were falling. It is natural to suppose that they must have fled to the side naves and placed themselves under the arches. But meanwhile the fire advanced, and no outlet was to be found. The doors were obstructed. Some few passers-by had given the alarm. Many flocked to the Plazuela de la Compania, reached the doors and tried to pull the people out, but it was impossible; it required the strength of a steam engine to move the compact mass of human beings locked together. Some with outstretched arms beckoned to those outside, others implored assistance, calling the succourers by their names; others could hardly speak, and only signified their wishes by a motion of their heads or lips. Some were suffocated with the weight of those above and around them, others were suffocated with the flames and smoke. Those who ventured to rescue them had to be brought or pulled out by a dozen companions, more dead than alive. All was confusion and alarm; the bystanders, tearing their hair and running about wild in the streets without being able to afford the least assistance. A man on horseback, a country guaso, threw his laso (or rope of hide which they always carry, attached to the saddle) into the church, and a thousand hands tried to catch hold of it. Some did seize it, and were dragged out by the man and the strength of the horse; but a second time the same attempt was made the laso gave way.

A few moments afterwards the bystanders saw the women inside in flames. Their clothes had caught fire, the fire had reached their heads, and their hair was on fire. A great flame came across the church, the doors and other wooden parts took fire. The sufferers dropped down their heads and arms without a shriek, and all was silence. The Church was a furnace, above and below the roof, and the victims underneath. Never was there such a spectacle, nor do I think history can present a parallel.

When I reached the spot all the interior of the church was a red flame. I only heard the cries, and of the people in the square and streets, the running about of wild men, and the crash of the dome falling in the midst of the ruins. A few minutes afterwards the tower or spire, also of wood, caught fire, and in a quarter of a hour was consumed and fell into the church. How many victims have perished? every one asked; every one was calling out for his mother, his wife, his sister, relative, &c. I immediately calculated that 1500 souls had perished, as I saw no women in the plazivela or streets. Some thought 60 or 100 a great figure, but during the evening the truth was to be discovered. Few had escaped; a small number had been brought out, half burnt and in a deplorable state. As the fire burnt itself out—for here we have, it is shameful to say, no fire-engines—the bodies in the church began to be visible as they lay in horizontal strata, or in groups standing or kneeling in their last posture, as the fire had caught them; the greater portion near the doors, others under the arches, others under the great bell, which had fallen on the group near the principal door. The appalling idea then presented itself to some persons that the dead numbered 500 or 600, but next morning when the bodies were removed and counted, the first lot numbered 1400, and still many remained. According to the lists of people missing which the papers publish the victims outnumber 2000. According to these lists the greater portion, say two-thirds, are servants and people of the humbler class; one-third at least belong to the principal families of Santiago.

The consternation was so great, the blow so tremendous, and the spectacle so appalling, that this catastrophe passed at first like a dream. None of the living slept that night, nor could many sleep for successive nights after.

There is hardly a family in Santiago that does not mourn the loss of some near relative. Two thousand victims sacrificed in a quarter of an hour in a small enclosure 60 yards by 30.

DISCUSSION.

Mr. PENROSE said the special point just raised would not apply to public buildings where there was no person inside except a watchman; in private buildings, too, he thought it was very rarely the case that the difficulty could apply, because in all houses the front or back door, as the case might be, was generally left with locks, bolts and chains, and any of the inmates could go out and in, in the same way as they could with this suggested doorway. No doubt in prison cells such doors would not be available, but he thought it would be about the only place. The simplicity of the thing made it difficult to make any further remarks about it.

Mr. HENRY DAWSON said he should be sorry to suppose he could not trust his servants to remain in the house after nightfall, and he apprehended the majority of persons did not lock the front door and put the key under their pillow. There was one trifling *desideratum* that occurred to him in the use of such a door, that in the case of a rush from some internal corridor it would be desirable, knowing how persons lost their heads in a panic, to have an inscription put upon the door, "draw the bolts." The only other point was as to the construction of the doors themselves, which he thought would require considerable care on account of the absence of the bottom rail. He saw that had been provided for by using a strong metal bar to connect the two stiles running up on each side, but it would need great care in the connections to keep the door from twisting.

Mr. JONES said he must admit that Mr. Dawson's remark recalled to his memory the fact that the first little model he made was for an iron door which had the bottom rail carried through, but he thought afterwards that would be a

dangerous trap, and had therefore modified it as was shown in the model.

Mr. WILLIAM WHITE, F.S.A., said he had recently designed a parochial room which might be used for meetings, public and private concerts, and for theatrical representations, and he had then found this very difficulty, bearing in mind that there was an Act of Parliament which could be brought into force to prevent buildings being used for public purposes, money being taken at the doors, unless provision were made for the doors opening outwards in case of fire or panic. He believed a great many people were entirely unaware of this Act of Parliament. In the case he referred to he had divided the door into two parts. It was a high pointed arch doorway, and this provision did not occur to him until after it was built, or he could have made the arch high enough to receive the square of the door in the opening with tympanum over. In this case there would have been no difficulty, but he got over it by dividing the door, and making one part open outwards, and the other part inwards.

Mr. HENRY DAWSON said: At the very threshold of our subject of "*Fireproof Construction*," we must consent to a limitation as to our meaning of these words—for I suppose it will be readily allowed that up to the present date, no system of construction for ordinary dwelling-houses, no more than for commercial buildings, which is really *proof* against fire, has yet been found possible. But nevertheless, I submit, we may fairly be content for the present with this *limitation*—viz., that we only profess to treat of those methods of construction of houses which, while providing for healthy and comfortable occupation, have also been found to offer practically the greatest amount of impediment to the action and progress of a *fire*.

The salient question, therefore, in our discussion appears to me to be, the kind of building materials which should be adopted for this "fireproof"—or perhaps we should better say "fire-resisting"—construction. Is there any special *characteristic* of such materials which can afford us a

general rule for selection? I think there is, viz., that for any material to be *at all fireproof*, it must have been already subjected in the process of its ultimate formation or manufacture to the action of fire at a considerable heat, or, as it is chemically termed, "calcined." Consequently, for walls and internal divisions of buildings and for staircases, good brick, in most of its varieties, and terra-cotta are pre-eminently suitable, and if judiciously applied are in most situations economical; whereas most, if not all, the stones we know are unsuitable and generally not economical.

Again, for floors and flat roofs and the footways of staircases, well-burnt clay, coke-breeze or furnace-slag, and Portland cement, combined in the form of a concrete, are most suitable and economical materials, and when skilfully applied in conjunction with wrought iron, they constitute under ordinary circumstances a reliable "fire resisting" structure for the horizontal divisions of all dwellings, reaching from the mansions of the rich to the houses of the artizan; whereas concretes composed of gravel or stone ballast, or the ordinary siliceous sand, are *not* fire-resisting. It is true that the *converse* of this useful rule will not always hold good, as in the important case of manufactured iron, which now enters so extensively into our modern systems of building. But yet it is found possible to render that valuable building material *practically* "fireproof," by encasing it, in part only, with some better fire-resisting substance. And this is practicable both with the vertical and horizontal iron carriers of weight. Take for instance the cross section column. Make and fit in the quadrant spaces round this column between each cross web from the base to the cap, a block of moulded fire-brick or hard-burned terra-cotta in one or more lengths, to be bedded and jointed in Portland cement, with cement dowels into the iron webs, in the way I have endeavoured to show on this drawing. Or, take the wrought-iron girder and joist in a floor,—all that is requisite is to fill in the spaces with good Portland cement fire-resisting concrete, and having only the bottom flanges of the iron exposed, which exposure has

been found in numerous instances to be no essential drawback to the resisting powers of the floor.

Again, for the covering of roofs under slates or tiles, the "*slag wool*," as so called, which has been added recently to our *repertoire*, has been found an efficient fire-resisting substance, and will be a valuable substitute for the oiled or asphalted *felt* hitherto in use, not only on account of this special property, but also of its superiority as a non-conductor of heat, and cold and sound. I also submit for your consideration that this new material may be advantageously used as an obstructive to the progress of fire through the ordinary wood floor, if laid to a sufficient thickness on "Barff'd" or galvanized iron lathing, through the spaces between the wood joists.

Then, again, for the ceilings of ordinary wood floors, "calcined gypsum," commonly known as "plaster of Paris," is another most suitable "fire-resisting" substance, and would offer a far more effectual obstruction to ordinary house fires if the wood laths were abandoned, and we substituted the galvanised *wire netting*, as now manufactured, and a specimen of which has just been exhibited to us by Mr. Horace Jones.

In connection with our subject, I would just touch upon "*Hollow brick walls*," that useful contributor, as we know, to the making of a house dry and healthy. The method frequently adopted is to tie the inner and outer thicknesses of the wall with *iron ties*, but I submit that these are a source of injury and danger to the wall in the event of a fire, on account of the metal's expansion, and moreover they are very imperfect as a means of bond; and I suggest that in all cases vitrified bricks, eleven and a quarter inches long at least and of the proper shape, should be used at the requisite intervals, which make a stronger wall and will resist the action of fire, and the difference in increased cost is but *trifling*.

In furtherance of "fireproof construction," I would also deprecate strongly the use of the four-inch timber stud partitions for the internal divisions of houses. These, although

lathed and plastered on both sides, are among the most successful helpers to the progress of a fire. They should always be of good hard-burned bricks, however rough. In most cases they need be only $4\frac{1}{2}''$, the half of a brick in thickness, and if these are built in Portland cement, with hoop-iron laid about three feet apart, and finished on each side with two coats of plastering, they are not more costly than the lath and plaster stud partition.

I must conclude by adverting briefly to that important part of every house—the *staircase.* The evils and losses resulting from the want of more fireproof construction in houses has been nowhere perhaps more palpably manifested than in the indifference shown as to the material and construction of the staircase. It would appear in most instances to be intended to *assist* rather than *retard* the progress of a fire. Whereas I think that with skill and care and no serious additional cost, it may be generally made a tolerably safe means of escape in the case of a moderate fire.

For instance ; make all the enclosing walls or partitions of brick well burned. The strings and newels made *solid* (and the better if of *oak*). The treads and risers of well-burnt brick or terra-cotta carried on brick corbel courses on one side, and on angle-iron next the strings. Or, if greater cost can be allowed, you may adopt light wrought-iron for the strings, with wood cappings, and cast-iron or oak newels. The steps and landings to be of cement concrete, as already described, and which may be made, as we know, to assume various designs and colours. The balustrades may be either of iron or hard woods. The skirting in all cases should be cement, and the finishings round doorways and windows in plaster or cement. If one of these last methods of construction were generally adopted, I am confident we should soon find a considerable diminution in the number of our destructive fires.

I will only add on this part of the house that it has often occurred to me that some composite fire-resisting material, easily workable into thin slabs and applicable for *panels of doors*, ought to be ere long discovered in this inventive age

of manufactures, and would be a most useful contribution to the obstruction of the progress of fire in a dwelling-house.

If our subject had permitted reference to the methods of connecting commercial buildings by iron doors, &c., I should have liked to make a suggestion on that point. But that I must leave to some future occasion.

Mr. H. H. BRIDGMAN said he thought the Institute might be complimented on the excellent series of practical papers which had been read, but he wished to make a few observations on a subject which had been not so much dwelt upon during the Conference as he had expected. Mr. Horace Jones had mentioned the question of fire-proof floors generally and the effect of fires, but other papers and speakers had reference to basement floors only; it appeared to him that the surfaces of upper floors required much more attention than had been devoted to them, as was evident from the consideration that nearly all the accidents which occurred from fires began in the lower parts of rooms either by lamps overturning or sparks falling on the floor, or similar accidents. The present system of construction of so-called fire-proof floors was very expensive, whilst generally it was not fire-proof at all. The present mode—where a floor-board surface was required—was to construct a concrete floor and then build an ordinary wood floor on the top of it, with sleepers, joists and flooring, and, to say nothing of the cost of that, it was not a fire-proof construction, particularly on the part where was most needed, viz., on the surface; for being hollow immediately underneath, it formed a series of flues which materially assisted combustion. What was wanted, therefore, was an economical system of solid floor construction of uninflammable materials, which should be impermeable to wet, prevent vermin getting in, and be otherwise sanitary, retaining at the same time a floor-board surface. The various systems of wood blocks he did not think was suitable to upper floors, particularly for dwellings, on account of the unevenness, numerous joints, and the cost;

and he only found two or three systems in the Exhibition of fire-proof construction, in one of which wood joists were bolted close together, and was much on the same principle as Mr. Jones had explained, though not encased with iron sheeting, which was necessarily very expensive. There was another example in the Exhibition which appeared to him to meet the requirement more than any of the others, viz., that exhibited by Messrs. Clark, Bunnett, & Co., and termed the Ligno-concrete flooring. It was only six inches in thickness, formed of shallow iron joists, two feet apart, filled in with cement concrete, on which was laid, whilst hot, a bed of mastic, and immediately on that the floor boards were laid, without nails, the mastic strongly uniting the whole in one compact mass. A span of thirteen feet of this construction would carry 2 cwt. equally distributed over the area, and that could be produced at a cost of 1*s.* 2*d.* per foot super, which came to £5 16*s.* 8*d.* the square, finished complete from floor to ceiling, including floor-boards and plastering. He would not disguise the fact that he himself invented that floor, if he might so term it; for having, as others had to do, occasionally to design large structures—and at present he was designing a building containing wards 80 ft. × 40 ft., and when he considered that this building had to be four or five stories high, he was appalled at the idea of constructing it with single joist floors and an ordinary floor surface, as is the case with all structures of the kind in London—it struck him that there must be some simpler mode of constructing a fire-proof floor than the one usually adopted, and he was therefore led to devise this plan, which he would not hesitate to say was the cheapest yet produced. The price above stated was found to exceed the cost of an ordinary single joist floor by about 2*d.* per foot only.

The CHAIRMAN, in closing the discussion, said the system of building hollow walls had rather been called in question, but it must be remembered that the hollow wall was really meant as a damp repellant, not as an equaliser of temperature; for that purpose, however, the ordinary

9 inches outside with 4½ inches inside, with iron ties connecting them, was very insufficient for anything but the very smallest houses. If, however, a wall were built of two thicknesses of 9 inches, and a cavity of 3 inches between, connected by solid continuous bonds of hollow brick 12 inches long at irregular intervals, you got all the advantages of a hollow wall with a blanket of air, and it was much stronger than a solid wall. In his opinion such a wall was far superior to one with only an asphalte lining, because though asphalte was admirable as a damp repellant, it did not, except in that way, affect the warmth and comfort of the interior as a hollow cavity did. This gave a blanket of air between the outside and the inside, and made the new house as warm as an old one. That was the observation which had been made to him by gentlemen for whom he had built houses during the last thirty years. Each one had said in his turn, when he came to occupy the house, that it was like living in a house 100 years old when he first went into it. The extra cost was quite immaterial. Mr. Robins had spoken on the subject of roofs, which, according to his experience, were more neglected than anything else in connection, not only with churches, but with ordinary houses, for the simple reason that people did not value the cavity system as they ought. Over and over again in building churches he had seen a mere thin coating of an inch and a quarter board with a bit of asphalt felt, and then slating on the outside, and then people complained that the building was not comfortable, and found fault with the methods of warming; the real fault, however, was in the roof construction, because people did not attend to the absolute necessity of making it as impermeable to the passage of cold air as the walls. When you went into a church you went into an attic, and very often into a badly-constructed attic, and if people supposed they can warm a large building like that with water-pipes used once a week they made a great mistake. If the cellular principle were adopted an attic might be made as comfortable as a drawing room. In his own house he had rafters 4 inches thick,

on which the tiles were laid dry; an inch and a half below the top surface he laid a thatch of reeds from the Norfolk Broads, which formed a capital non-conductor. They were laid vertically, so that if any wet got in it would run to the outside. Then on the inside of the reeding he put a coating of plaster, which made a tolerably substantial wall 4 inches in thickness. Then underneath that again he had a ceiling consisting of joists with boards on the top of them, and a ceiling inside, and thus he had the attic as comfortable as the warmest drawing-room. In a small cottage which he built many years ago the walls were only 6 inches thick; they were constructed of wood with studs, on which plaster laths were nailed on each side, and a double coating of plaster, and another cavity plastered inside again, and that made as comfortable a wall in the thickness of 8 inches as it was possible to construct. Of course it was only applicable to small houses, but he did not wish Mr. Robins' animadversions on this cavity system to go unrebutted, for he did not think there could be a better system for keeping houses comfortable. He was very glad Mr. Waterhouse had described so simple a plan of ventilation, which he knew acted most admirably. The first time he saw it, it was carried out by means of a zinc pipe coming from the ceiling and entering underneath the fire, which was perhaps as good a plan as any. With regard to Mr. Jones' doors, they were no doubt perfectly safe when you got to them; but in considering the risks to be run from fire, unless you had some means of escape down to the door, the door itself would be of little use. One thing which was almost overlooked nowadays in the building of houses, which was cheap in price, and could be applied to houses of £30 a year and upwards, was the making of a staircase of stone built into "Newell" walls and the side wall; if that were adopted it furnished the best fire-escape which could be made, and a very good example of it could be seen as old as the time of Henry VII. in Lambeth Palace.

Conference on July 12th, 1884.

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1. "*Sanitary Aspects of Internal Fittings, &c.*" By G. Aitchison, A.R.A.
2. "*Hygienic Value of Colour in the Dwelling.*" By William White, F.S.A.
3. "*On Water Supply.*" By Thomas H. Watson.
4. "*Concluding Paper.*" By Professor T. Hayter Lewis, F.S.A.

The Conference resumed at 2 P.M. The Right Hon. A. J. B. Beresford Hope, M.P., in the chair.

The Chairman said he conceived it a great honour to be asked to take the chair, particularly as it was one which was consequent upon a previous honour which he should always look upon as one of the greatest of his life, that of having for a former term filled the chair of the Institute of Architects. It was a right and happy idea of the Institute to come forward and claim its own share in the Health Exhibition, for what could be the meaning of architecture if it were not the science of contributing health, happiness and longevity in the most permanent of all circumstances of a man's life, viz., his house. His clothes wore out and got shabby, his food perished in the consumption, but his house ought to be a part of himself and a part of his family, and, it might be, the inheritance of that family, and therefore it was the duty of architects to make houses not merely beautiful

and luxurious, but healthy, and in proportion as sanitary science became more and more exact, less experimental, and more precise and certain, so did the responsibility increase upon architects to be with the physician the minister of health. There was one feature of the Exhibition which he had very much enjoyed, but had still more puzzled over, viz., Old London. No doubt the Exhibition was meant to be an apostle preaching health, and to produce that Old London, with all its exquisite picturesqueness, as a proof of how delightful and yet unsanitary a city might be, almost led him to say "an enemy hath done this." When he went in through that frowning gate, between those gabled houses exquisitely carved, the charming middle row, the house with its tourelle, he thought what could be meant by all this but to show the humbug of health and the beauty of insanitation. He thought something more was wanting in that part of the Exhibition, and that Mr. Birch ought to have put himself in consultation, say with Messrs. Atkinson, of Bond Street, or some other purveyors of delicious smells, and have obtained from them the concentrated odour which a mediæval town would probably yield. Should there not have been gurgling down the middle of the street one of those streams, not a trout stream exactly, but of a good deep brown chocolate colour, such as flooded the roadway of mediæval cities? Instead of that hard pathway, should there not have been that delicious yielding substance, composed of many materials, which was what the mediæval ladies and gentlemen had to tramp through. If all these things had been provided, the street of ancient London would have been far more correct in its appointments; as it was, the beauty was evident, but the insanitation had to be guessed. He was early in the year very much struck by seeing in the *Builder* a plate by Mr. Brewer, who was equally great as an artist and an architect, which was exceedingly picturesque and exceedingly sad. It represented a mediæval town, all gables and carvings, clustering round a German minster of exquisite Gothic proportions, but not a human

being was to be seen, and in the accompanying letterpress it was explained that the idea was a city which had been desolated by plague, and was now uninhabited. The date of the drawing was about the end of the 16th century. In the middle of the picture there was a sluggish stream with some broken steps down which the maidens went to fetch the drinking water, and a little further that stream lost itself in a low narrow archway under the houses. In fact it was at once the common sewer, and the common conduit of the town. He was much struck with this picture, there was something so pathetic about it; the great beauty of the whole, and yet the history it revealed, suggesting the sufferings which must have attended the long plague by which the city was ultimately desolated. He hoped the picture would be reproduced, for it deserved to be perpetuated in a more permanent form. Only one thing more he had to point out. If those who were engaged in this great health crusade imagined that their only duty was to build sanitary houses, they overlooked half of their task, for it was quite as important to carry health into existing buildings as to create new ones of a healthy type. It was not merely the poor buildings, or crowded buildings, or the misbegotten productions of the jerry builder, which had to be dealt with. Many of the most stately and most luxurious buildings that people in the most easy circumstances loved to inhabit, equally required attention. There were no more treacherous buildings than those of the last generation, when mechanical science had attained a high perfection, and chemical investigation had not advanced equally. To mention one instance with which he had had to grapple with himself. Nearly fifty years ago a certain house in the West End of London was fitted up regardless of expense, by a man enlightened according to the views of those days, and extremely munificent, with all the most charming appointments that were thought requisite in those days, and amongst other things provided was a service of hot water to most of the bedrooms. In a few years this house changed owners, and the successor had the hot water

apparatus cut off. Years rolled on, people were born and grew up in that house, but now and then strange smells were noticed, and the inhabitants felt heavy and depressed in many of the rooms. Not many years ago an investigation was made, consequent on one of these smells being very obtrusive in a room in which the disused hot water service existed; and, to make a long story short, this hot water service was found to be simply a machinery for passing, without let or hindrance, sewer gas fresh and rich from the main sewer all over the house. The service had been laid on by one of the first hands of the day. The simple view that gas would rise never occurred to anyone in those days. He would only say in conclusion, that whenever anyone bought, or hired, or inherited, or altered a house, he should first of all look out for forgotten and hidden cesspools. Speaking from a sufficient experience, though within a limited area, he could say that the number of these forgotten cesspools was inconceivable, and the mischief they were doing all round was quite immeasurable. If the search for old drains and forgotten cesspools were systematically set on foot, he believed that the death rate and disease rate would be notably diminished.

SANITARY ASPECTS OF INTERNAL FITTINGS, &c.

By G. AITCHISON, A.R.A.

LADIES AND GENTLEMEN,—I have been asked to read you a paper on the Sanitary Aspects of the Inside Fittings and Decoration of Houses.

The two prime necessities for health are pure air and pure water. I believe we in London have generally little to complain of as regards the quality of the water supplied us by the companies, however much we may complain of the cost; but as to the air, "the least said the soonest

mended." Swift's description of London milk in his day pictured a wholesome beverage as compared with the air we have to breathe. I presume the native air of London is much the same as other air, perhaps a little moister from its contact with the river, but we necessarily adulterate it by the breath and exhalations of 5,000,000 human beings, without taking into account the breath and exhalations of millions of horses, jackasses, dogs, cats, mice, rats, pigeons, sparrows, and other animals; we wilfully adulterate it by the filthy condition of our roads and streets, by pouring into it the vapour from our sewers, and from the blow-holes of the Metropolitan Railway, and the gas and smoke from our factory, steam-engine and domestic chimneys, so that what with the carbonic acid gas, the sulphuretted and carburetted hydrogen, carbonic oxide, the vapours of diluted sulphuric, nitric and muriatic acids, our constitutions are ruined. But there are thousands of other noxious vapours that help to form the delicious fluid we breathe; and, lest the gases and vapours should not supply us with enough poison, we have the mixture thickened with the fine particles of iron, stone, leather, cotton, wool and hair, horse-dung and soot. Those who have gone before me have probably told you some of the requirements for keeping the air and water inside your houses no worse than they are outside, for if you want the water better, or at least more wholesome, you must boil and then filter it through a clean filter; you must sift out the coarse particles from the air, filter or burn the fine particles, and absorb the deleterious ingredients. You have probably been told how to keep your houses dry, how to prevent damp vapours from rising inside them, how to let in enough sunshine, and how to warm and ventilate them; and, as the learned gentleman who comes after me will tell you how health is affected by colours, there is little enough left for me to say.

The old Roman's prayer was to have a sound mind in a sound body, and, were it not for the foul air of London, there seems little reason why Londoners should not be as

strong and healthy as the old Romans, if they would but imitate their example; for, though we have less warmth and sunshine, we are rarely afflicted with ague, and have none of those mephitic exhalations which are supposed to have caused their pernicious fever. The Romans lived hardily and sparely, drank but little wine, and well tempered that with water; they exercised themselves every day in gymnastic exercises and their drill; they rose before the lark, and went to bed with the lamb, and by means of a daily Turkish bath kept their skins in perfect condition.

You all know that Count Cornaro was so eaten up by indigestion, gout and rheumatism, that when he was forty he was told by the doctors he had not six months to live, yet, by merely limiting his diet and his drink to what was purely necessary, though he was no teetotaler, taking plenty of outdoor exercise and keeping himself cheerful, he lived in health and happiness until he was ninety-eight years old, and some say that he was more than a hundred. There is another point to be mentioned. Don't overwork yourselves; remember the French proverb that you should "Never kill yourself to get your living." And don't fret yourselves; "Sufficient for the day is the evil thereof."

I fear you will say all this has little to do with the internal fittings and decorations of houses, and that is true enough; but if your bodies are crazy with late hours, over-work, over-eating, over-drinking, want of exercise, want of rest, and want of quiet, you would find Paradise itself unwholesome. I am inclined to believe, in the present state of London air, that if every house could be properly built and properly ventilated, it should be hermetically sealed to the outer air; but I fear such perfection is hardly to be looked for in our time, and I therefore say that the things we have mainly to guard against are dirt, dust, and the fouling of the air. By dirt I mean, when speaking to an audience like the present, the street mud we bring in with us, consolidated external and internal soot and dust, and such soft matters that are occasionally dropped about, such as particles of food, and the like. Every crack in a

floor gets filled with this, so it is of the utmost importance that this dirt, if not to be excluded, should at least not rest for ever with us, and be liable to putrefy when exposed to damp and warmth. Every open joint between the floor-boards, and beneath the skirting, is usually filled up flush with dirt. Besides the dust from the streets, we make our own dust inside our houses ; particles from shoes, from wood and stone, from our clothes, oil-cloth, mats and carpets, are constantly being worn off and carried for a time in the air, together with the scales of our constantly renewing skin ; and as soon as the moving air is overladen or becomes comparatively still, everything is covered with light dust, and a great deal of this dust is what the doctors call septic, or putrefying dust. Mr. Brudenell Carter, the eminent oculist, in his letter to the *Times*, described how he had reduced this to a small amount, and that, in consequence, the health of his family had improved. As regards floors, constant wetting is not wholesome, and even scrubbing will not remove dirt far down in the crevices of boards. Nothing is better for preventing the permanent location of dirt than really good, hard-wood polished parquet, but if that be found too expensive, then let the joints of the boards be well scraped out, filletted with wood when wide, and let all the joints be puttied. And let the whole floor be painted or varnished ; dust is then more easily and completely swept up, and a wet flannel cleans the floor ; but with parquet, perhaps a washing once a year is enough with clean sweeping, and the wholesome application of turpentine and beeswax.

These remarks apply also to all open joints in woodwork, furniture and plastering ; they all get filled with dust, and should be puttied up, and the dust kept out. Smoothness of surface is also a great help to cleanliness, and certainly as few ledges and holes for dust as possible should be left where the parts cannot be daily dusted. This particularly refers to wall surfaces, and to undercut ornaments in cornices and the like ; tall bookcases and cabinets always have their tops covered with thick dust.

As to woven things, whether of cotton, wool, or silk, the less there are of these about a room the better; and wholly carpeted bed-rooms are simply an abomination. A few rugs in sitting-rooms for the feet are certainly all we require, and woollen shoes are better than rugs in a bed-room, for, though rugs are easily moved and the dust under them swept away, we know from Mr. Spurgeon's converted housemaid that this is not always done, for when she was pressed as to her works that were to prove her faith, she triumphantly pointed out that she now never swept the dust under the mats or hearthrugs, but always carried it away.

What is still worse than a carpet, which is usually beaten yearly, is tapestry or other woven hangings, which often remain in position until they are worn out. Blinds we must have, but they can be glazed, and they generally get a yearly washing; but we might altogether abolish door and window curtains, and woven mantel-shelf coverings, and such like follies. It would also be healthier if we covered our chairs, seats and sofas with leather, instead of silk, velvet or cotton. The gilt and enamelled leather we can get, if not quite so beautiful in point of sheen, may be of excellent design and harmonious colour.

Next to polished wood, tiles, marble, glass and marble mosaic, the best wall finish is oil paint; this can be made agreeable to the eye by simple flat tints of harmonious colour, or it can be ornamented with floral or arabesque ornament, or with the highest triumphs of the painter's art, and this last will not only mark the owner's real taste for art, but will prevent the accumulation of dust on the picture frames.

Unfortunately oil paint, except in flat tints, is beyond the reach of all purses. We must all admire the great skill that has been displayed in the designs of paper-hangings, which charm us by the beauty of the forms and colours with which they are enriched. It is needless to say that if damp gets into the walls or partitions on which paper is hung, it at once becomes a source of danger from the

putrefaction of the paste with which it is hung, and the size used in its printing. Wall-papers, too, absorb foulness from the atmosphere, and must be often renewed, and when this is done, it is of the utmost importance that all the underlying paper should be stripped off and the walls washed.

Flock papers should never be used, except when they are painted over, as they form a natural receptacle for dust, and seem made to absorb the greatest quantity of foulness from the air, and when the flock is not dyed "in-grain" but coloured over, whenever it is touched some of the colouring matter comes off and is mixed with the air of the room.

I am greatly inclined to recommend the varnishing of all papers that are not washable—they can then be cleaned with a sponge; but it is absolutely essential to varnish them in nurseries. Children will lick the papers, and neither lead, copper, nor arsenic can be good for them, nor are size and whitening substances you would give to children without medical advice.

Let me say here that you cannot have your windows cleaned too often. When they are dirty they not only exclude light and sunshine, but are covered with thickened human exhalations and dust. If you are wealthy enough to have a dressing room, banish into it every superfluous article from the bedroom; half the bedrooms in London are encumbered with cupboards full of boots, and wardrobes of old clothes, with baskets for dirty linen, books, ornaments, curtains, carpets, and the like, not to speak of mouldy sponges, nail and tooth-brushes; these things occupy some of the air space, and pollute the remaining air with their exhalations.

By far the most important thing in a room is its ventilation, yet as a rule no room has any direct ventilation, except through the chimney and an open window, and when the window is shut the only ventilation is by the fireplace, so that all the air that comes in, is tainted with soot; the highest point of the opening is below the mouth when

sitting, and often when in bed. If any one wants to know the effect of this, let him get the library ladder, and go gradually up it when he has been sitting long in a room with the door and window shut and a gas-light burning; a foot or two above the level of the burner the air is found to be hot and close, very much more so when he is above the top of the door, and unbearable above the top of the window, for some air generally gets in from the crevices of the doors and windows, particularly when the room is much warmer than the air in the passages or the street.

It is stated that to keep a closed room sweet, fifty cubic feet of air is wanted for each person for every minute he remains in it, or three thousand cubic feet for an hour. Consequently a room, 20 × 15 × 10 feet high, only contains enough wholesome air for one person to breathe for an hour; most of us would consider this a large bedroom, which we should be content to occupy without any express ventilation for from eight to ten hours. Fortunately for us we raise the temperature of the air of a room by merely remaining in it, and the colder air then seeks an entry. The imperfection of workmanship affords access to the fresh air through the crevices of ill-fitting windows, doors, floor boards, skirtings, and the like, besides what penetrates through the substance of the walls, partitions, and ceilings. Were it not for this accidental fresh air death from suffocation would be quite common in bedrooms without a fireplace, *i.e.* if the rooms were as hermetically sealed as the receiver of an air pump. But we may see what damage we are doing ourselves, when we know that one of the main exciting causes of consumption is foul air. In this dark climate artificial light must be used in our sitting rooms, and is generally used in our bedrooms. For an equal illumination, gas fouls the air less than any other light got by combustion, and the reason we feel gas more, is because we use much less light when we burn lamps and candles, and also because gas is rarely perfectly burnt, and some escapes into the room; gas must have some sulphur left in it to

ensure detection when it escapes. At any rate we all know that a room well lit by gas will communicate its foul taste to the air in ten minutes after it is lit.

I have found that a room may be fairly ventilated, and be free from the taste of gas, by using Boyd's Hygiastic grates, which supply fresh outside air warmed in a chamber at the back, with Rickett's or Hammond's Ventilating gas pendants; these not only carry off the products of combustion, but also remove much of the vitiated air from the room. In new houses the ventilating-box of this gas pendant should be carried into a hollow chamber round the flue pipes, or into one of Boyd's Ventilating flues; these latter have iron plates to form the withe between the smoke and air flues, so that when there is a fire the ventilating flue is heated.

When this ventilating-box is carried into a smoke flue, or even into an empty flue, particularly when ventilating grates are not used, there is often a difficulty with it; in the case of smoke flues the smoke is brought into the room, and in case of empty flues the cold air is often drawn down so violently as to extinguish the gas; or when the draught is less to cause the gas to flicker, so that you cannot read by it. We may hope soon to have in our rooms the electric light in vacuo; but even then it will not enable us to dispense with ventilation.

It has been found that the colours of rooms have a very important influence on health, but this subject will be treated by my successor.

I have no doubt that beauty of form and colour have a very important effect upon our health. Nature makes everything useful, and most things beautiful; and as she usually attains many ends by one means, the beauty she so lavishly spreads for us may be as good for our health as it is necessary for our delight. All of us can bear witness to the dulness of a room of one colour, in which we have to sit when we are without occupation, and the desire we then have for some beautiful and intricate

pattern to relieve its monotony. Lord Brougham's well-worn quotation then impresses us :—

> "The want of occupation is not rest,
> A mind quite vacant is a mind distress'd."

When a room is adorned with pictures we have not merely occupation, but delight, and those higher emotions that are only excited by the fine arts. When we choose wall papers, those that are most beautiful in form and colour are to be preferred. We should, however, satisfy ourselves that the patterns on the papers with which our rooms are hung have not a look of motion. Nothing is more distressing than to be in a room where the pattern of the paper seems always moving like a drop of dirty water under the microscope. It would be well if we could have all things about us beautiful in form, elegantly simple, and all the colours harmonious and restrained; these great qualities seem to impart to us the feelings of self-restraint, dignity, and repose.

I am afraid I have trespassed too long on your attention, and I can only hope that the few simple truths I have put before you in so homely a manner may have the effect of drawing your attention to this subject; and if this paper does no more, it may serve as a contrast to the learned and eloquent papers that have gone before, and will follow it.

HYGIENIC VALUE OF COLOUR IN THE DWELLING.

By William White, F.S.A.

In treating of this subject I must claim your attention briefly to the hygienic value of colour in itself, and apart from the pigment or colouring matter which represents the colour, and with which alone we are commonly considered to be primarily concerned. Colour has been regarded too much as a mere matter of taste, art, fashion, fancy, luxury,

civilization. It is all this, but it is a very great deal more than this from a sanitary point of view. To some it may seem trifling, to some a mere truism, when I gravely and seriously maintain the great need there is for teaching the public generally that colour is indispensable to man's well-being and happiness; and that the deprivation of colour might render him liable to physical and even mental deterioration.

Good colour imparts to the interior of a dwelling a finished and cheerful effect, to which none can be wholly insensible whatever may be their notions as to its real influence. Our optic nerve is directly and actively exercised by the presence of colour. The senses are thus affected by colour as they are by other external influences, such as light or warmth. It is a recognised pathological fact that colour of some sort is indispensable to the healthy condition of the eye, and that the condition of the brain again is greatly dependent upon the healthy action of the nerves thus affected. These nerves are affected in a way sensibly different by different colours; in other words, in obedience to, and in accordance with, the pace at which the pulsations of light reach the eye, and upon which depends the nature of the colour seen. This sensitiveness extends also to the brute creation. By red these nerves are excited. By green, in like manner, they may be soothed; or they may be rendered torpid by the presence of blue. Yellow, like light, is the colour which the most strongly attracts the eye to itself. We are affected by black and white in the same sort of way as by darkness and light. Light in moderation will produce alertness or wakefulness; in excess it may produce restlessness and languor by weakening or dissipating the powers of attention. Shade may induce a frame of mind favourable to attention, contemplation and repose; in excess it may induce melancholy and depression.

It is undeniable that the human system is thus affected; and when, from want of proper colour, these nerves have not been duly exercised, red is the colour most acceptable to the eye, bringing into healthy action the organs that had

become inert. Hence, again, it is, that after long and close application, especially within doors, the eye can repose with satisfaction upon the soft blue of the sky or of distant scenery. The change is really needed; by the colour alone the optical sense is relieved, and the eye is content to rest, in its extended focus, upon this cool and refreshing and, as it were, more distant colour—this perfect mixture of black with white, of darkness with light. It may be of comparatively small moment to those who enjoy constant change of scene, occupation or action. But all who labour require recreation and refreshment. And it is surely difficult to understand how it is, that with all the popular outcry for light and cheerfulness in hospitals, unions, schools, homes for the poor, a similar outcry for even a moderate amount of well-disposed colour has been but rarely if ever heard. That the sick and the poor should necessarily be condemned to drag out their existence within whitened walls, and without a spot of colour to relieve the dulness, to cheat the cheerlessness of their monotonous life, shows that sanitation has not made the same advance in this as in other branches of the science. And herein Miss Florence Nightingale has much to answer for. In her excellent and popular notes on Nurses and Hospitals, she recommended the use of glazed pure white tiles for the lining of the wards, to the exclusion of buff and red, or other colours which might be more cheerful, less glaring, and less costly.

Colour may be called a plaything or luxury, but there are few persons, if any, who would be able to live for a long period in a light whitewashed, or in a dark black-washed, apartment, void of other colour, without deterioration. In the one case a tendency to idiocy might be induced, and to melancholy madness in the other. People have been blinded by the white glare of the desert sand, or of the mountain snow. They have become mad or imbecile, through confinement in a dark cell. This must not be called an exaggerated illustration, dragged in as a mere sensational argument; for, as in other matters, it is mainly through the more fatal results that men can be brought to

see the great danger of neglecting precautions which to them have appeared to be trifling, needless, and obscure. I have learnt, by my own experiment, that in the blinding, burning snow of high altitudes the eyes and the skin may be effectually protected by a change apparently so very slight and trifling as that of wearing a brown gauze veil instead of a blue one. Special colours have been used medically in shades and glasses for the protection or preservation of the sight. The fact of some blind persons being able to feel colour with the finger shows how wonderfully their perception is connected with the whole nervous system. I remember the case of a blind boy, who described the touch of a scarlet geranium as the sound of a trumpet. It is said that many of those who are called colour-blind are not insensible to the influence of colour, although they may not have the power of distinguishing between certain complementary colours. The optic nerve may perform its office, but there would seem to be some local condition of the retina or of the cornea which interferes with the reception of certain rays.

In order to be healthy and cheerful, colour should be æsthetical; that is, in true accord with right perceptive feeling; in accord with Nature, from the study of which all our best colouring is derived. We need not, for daily use, gaudy and startling effects, nor yet a dull monotony, but colouring of such force and variety as shall be essentially cheerful and agreeable. Hence we see that the employment of colour is not a matter of mere option or of taste, but of healthful, cheerful, and wise enjoyment. It must not be said, therefore, that I unduly exalt the office of the house decorater if I insist upon the artistic employment of good and harmonious colour, as well as upon the use of wholesome colouring matter in the most ordinary finish of the dwelling. And this brings us to the practical application of the subject to common use.

It is of course imperative that the walls should be constructed, and prepared, properly to receive decorative finishings. The necessity for this yet more strongly forces

itself upon our notice when we find that the elements of decay supposed to arise from damp in blistered softening plaster are intimately and unmistakeably connected with bacterian life and activity. The investigations of M. Parize have shown that this life will permeate from an infected surface into those portions of a wall which may appear as yet to be perfectly sound. This may serve to indicate also the unwholesomeness of accumulating layers of old paper-hangings, and bad paste or size.

The preservative properties of preparations of lead and arsenic, when employed in decorative work, whether internal or external, arise no doubt to a considerable extent from their antagonism, as to all organic life, so also especially to this species of vitality. But this cannot justify the continued unwholesome use of lead and arsenic for the decoration of dwelling-rooms, though the house-painter will still insist that white-lead and oil-paint forms the most efficacious covering medium that has been discovered. The trade in it has been long established, and he has been educated in its use ; he is disinclined to change, and he justly hates mere experiment. But in interior painting substances are now gradually taking the place of white lead, which have ceased to be open to the charge of being experimental. The scientific investigation of their respective merits can be carried on only by those who devote themselves for the time to the subject, and many of these things will be submitted to scientific test under the auspices of this Exhibition. But the substance called Charlton-white seems to have established its reputation as a wholesome and permanent covering ; and the different forms of Silicate paint are innocuous, and efficient for purposes of decoration. The colour of many pigments mixed with oil deteriorates, some tints fading whilst others deepen or turn almost black —varnish turns yellow with age. Thus the tone of the tints beneath become changed with time. A varnished wall surface loses its clearness and freshness in the course of years, though still retaining a pleasant tone ; and it is otherwise of the greatest value, especially in London, on

account of the ease with which it may be wiped down, and kept free from the accretion of dust. But an ordinary tinted paper with dado below and lighter colour above, hung on clean and sound walls, and varnished, is one of the best, most wholesome, durable, and cheap modes of good and simple decoration. A still less costly, but less durable decorative medium is to be found in the washable distempers, such as the Duresco, made by the manufacturer of the Charlton-white, or the Calcarium. Their great advantage is that the colouring-matter does not rub off on the clothes, or into the air as dust. One of the most valuable of decorative media, is the Crete-enamelling of Messrs. Owen, of Brook Street. Unfortunately they are not represented here. They do not like to appear to use such Exhibitions as an advertisement. A lesson which might well be learnt by some whose interest in the hygienic success of the Exhibition appears to be on the side of reciprocity, with one foot, at least, down in the scale; and who would seem to be pointing at themselves in sarcasm the old proverb that "Good wine needs no bush," some of their wares having far less to do with sanitation than with commercial enterprise or money-getting. The Crete-enamel is more costly than paint in the first instance, but it keeps its first freshness longer. It is perfectly innocuous, and is less absorbent even than varnish. It possesses all the advantages of varnish without its disadvantages. And when I say that in its washable form it is in fact a colour-polish, its superiority over varnish in appearance must be manifest. In its unwashable form it is still non-absorbent, but is more liable to injury though equally durable.

Paper-hangings, again, are now made washable at the small cost of one penny per yard. It is of the greatest consequence that their colouring-matter should be free from volatile mineral poisons; and that, whatever be its composition, it shall not rub off. The penalty should be sharp and heavy upon those who offer injurious paper-hangings for sale. In every case, pending legislation, the

purchaser ought to demand a written or printed warranty from the vendor. It would be a new departure, in the most desirable direction, if the Sanitary Institute, or some other such body, could establish an organisation for the protection of the unlearned and unwealthy portion of the public from the supply of such deleterious things. Only a few years ago even a medical man, a tenant of mine, who had selected his own paper for the dining-room, was made seriously ill from the imperfectly-fixed colouring, of rich yellow and brown, made with orpiment of arsenic. Other members of his household suffered, as well as the men employed to remove it from the walls. It is a satisfaction to know that except upon the score of unscrupulous trade competition, it is needless that such goods should be sold at all. There are several comparative illustrations of this in Mr. Henry Carr's Exhibit, No. 852. Messrs. Woollams, Jeffreys, Heywood, and others, exhibit an ample variety of all colours and shades in a guaranteed harmless quality. In admirable decorative material we have also the Hindley's Japanese leather papers, Lincustra Walton, Hall's Coro-vellum, and others, together with a variety of damp-proof paints for interior surfaces, of questionable value in this especial respect, seeing that damp should be kept from penetrating from the outside, and not be merely covered up from sight within.

As a wholesome decorative covering for walls, a panelling of pine or fir is said to be one of the best on account of its resinous odour. But such panelling must not be allowed to become a harbour for damp stagnant air behind it. These with other woods of a harder nature have always been popular. And a beautiful variety has been introduced in Roberts' Foreign and Colonial Importations.

But unprotected panelling becomes dangerous in case of fire. There are now, however, for woodwork invaluable safeguards against fire, such as the Asbestos paint, and the Cyanite paint, which ought to be made use of largely for wall panelling and floors. Calamitous fires have been already prevented by the employment of them. But we

cannot, with all of them, quite so perfectly preserve the charming brightness and freshness of the natural grain of the wood beneath them, and, indeed, a painted surface is more commonly implied by their use, and they need, so to say, a fixing. Nevertheless these paints give a good grounding for subsequent applications, whether paint, polish, stain, or varnish. It ought never to be forgotten that in floors it is not enough to dress only the parts which will be covered with carpet. And care ought to be taken that the dressing should be an impervious preparation of some sort or other; so that the floor may be wiped or washed without becoming saturated with water. Unless the boards are ploughed and tongued the joints should be well filled, so as to prevent draughts to the feet, the percolation of water, and, above all, the circulation of dust, to which an open joint is but too favourable. A wide field for wholesome decoration is opened up by the fibrous plaster and canvas plaster, made by Jackson and others, but their use may afford an unfortunate inducement to the finishing of a house before its newly-built walls can be properly seasoned for healthy occupation.

In conclusion, I will only say that we may well congratulate ourselves that we live in an age when colour is more prevalent and more really appreciated for its own sake than it had been for a long time previously. I have had the pleasure of throwing together a few general hints as to its application. And convinced as I am that it has been ordinarily regarded too much as a mere personal indulgence for those who can afford to spend their means upon their own amusement or gratification, I would express a hope that I have succeeded in asserting its claim to be considered one of the many requisites of a healthy home.

DISCUSSION.

Mr. THOS. W. CUTLER said he thoroughly agreed with all that had been said by Mr. Aitchison. Referring to the prime necessities of health, pure air and pure water, he feared sufficient attention was not paid to the storage of water, or the receptacles in which it was stored, though this matter was, if possible, more important even than drainage. The necessity for pure air was known to all, although little trouble was taken to obtain it as pure as possible. One of the great causes of dirtying the air, if he might use the phrase, was the large volumes of smoke allowed to escape from the chimney, which again descended in the shape of soot and injured the furniture coverings and hangings, and blackened everything around. This might be almost entirely prevented by using properly constructed grates, which were now easily obtained, and had the additional advantage of lessening the consumption of fuel. The simplest way to ventilate rooms was by the admission of fresh air through the windows, or upright tubes, in the summer, and by ventilating grates for the admission of warm air in the winter, and this could be effected without additional cost if the fire-place had a hollow chamber behind to receive fresh air instead of being filled up solid. There is now a long list of such grates to select from, such as Captain Galton's, Boyd's hygiastic, Shorland's, Brown and Green's, and many others which might be seen in the Exhibition. Considering the important part which the open fire played in our houses, in daily life and in health, he did not think this subject was sufficiently considered by Architects. Knowing the vital importance of fresh air in bedrooms, where nearly one third of our lives was spent, he was surprised that people should continue to exclude the air by keeping their windows closed at night. The

fear of catching cold might be obviated by commencing to practice it during the summer months so as to get acclimatised. An unventilated bedroom immediately after being vacated by its occupant in the morning was not pleasant to enter, reeking with foul air, sleep in such an atmosphere must have been unrefreshing, and rendered the occupant unfit to begin the work of the day, to say nothing of sowing the seeds of disease. The cleaning of floors by wetting them was unwholesome, and hard wood floors were much to be preferred. If the cost of this were too great, deal floors stained, waxed, and polished, were best for London, as they could be dry cleaned. Washable papers could now be easily obtained, and were very desirable. He fully concurred with Mr. Aitchison in recommending that all superfluous clothes, boots, &c., should be banished from the bedroom and dressing-room, or stored away for the season, the principal object being to keep the bedroom as simple and airy as possible. The use of gas could not be dispensed with now-a-days, but in order to use it to the best advantage there should be a tube over every burner carried into a flue, so as to preserve the rooms from the products of combustion. This was done in hospitals and public buildings, and there was no reason why the same system should not be applied to private houses. With regard to Mr. White's paper on the "Hygienic Value of Colour in the Dwelling," he fully agreed in the necessity of educating the public on this point, not only from an artistic, but also from a hygienic point of view. There was no doubt that bright and cheerful colors gave pleasure and tended to health, whilst dark and dismal colours produced melancholy and unhealthy growth, especially amongst children. Amongst the uneducated this matter was no doubt carried to an extreme, women of the working class being often seen with one colour piled on another until they looked as gay as tropical birds, but unfortunately without the delightful harmonies and contrasts which Nature displayed; on the contrary, they seemed to revel in bad purples, magentas, and other abominable aniline dyes, proving that a large

portion of the public were æsthetically colour blind. He regretted to say that this affliction was not confined to the poorer classes. A well-known author had said that in our younger days when full of enthusiasm we looked upon life as white, but when older, and soured and disappointed, life appeared black, whilst in middle life, having become more worldly and matured or philosophical, it appeared of a gray tint. The beneficial or prejudicial effect of colour was now fully recognised by medical men and philanthropists, as would be seen by the decoration of hospitals and asylums, where formerly the rooms were invariably finished a cold toned white, whereas now the healthful effect of cheerful colouring was fully recognised, hospital wards being painted or distempered in pleasing tones of colour, and cut flowers, chromo lithographs, copies of well-known pictures being distributed about the rooms greatly to the relief of the inmates. In connection with this point he would strongly advocate that children should be educated early to appreciate good colours, not by lessons, which he deemed would be impossible, but by surrounding them with good designs and colours on the walls of their nurseries and bedrooms, so that intuitively they might learn to appreciate good colours, harmonies and contrasts. Mr. White had accused Miss Nightingale of having much to answer for in recommending glazed white tiles for wards, but he felt bound to defend that lady, not only for the immeasurable good she had done to the world at large by her works on nursing, but for her most able work on hospital construction, which was written at a time when comparatively little was known on the subject. She might have made one mistake by advising the use of white tiles. On the other hand, she had bestowed numerous blessings and more sound common-sense advice than any other writer with whom he was acquainted, and she was one of the first to advocate the use of cheerful colours, flowers, pictures, &c. He did not advocate the use of white tiles in the wards, though he did in the administration, where every sanitary article should be of white glazed porcelain, so as to show the slightest

particles of dirt. He also agreed with Mr. White as to the advisability of discontinuing, for the purpose of internal decoration, the use of white lead, as there were now so many other materials which could take its place with great advantage. The use of varnish in London was almost a necessity, and for hospitals, nurseries, and bedrooms decidedly so. Leather and glazed or washable paper hangings and lacquered papers were the best wall coverings, and he believed no good firm now used poisonous pigments. If panelling the interiors were adopted, Roberts' foreign and colonial woods or hard polished surfaces could be recommended; there was a complete scale of colours from white to black, and in most cases they would not be found more expensive than pine decoratively painted, in fact in the long run they would be found cheaper, and much superior in a sanitary point of view.

Professor KERR observed that two practical points brought forward in the papers were the avoidance of dust and the introduction of colour. It seemed to him well worthy of consideration, not merely of architects, but of those who were in command of architects, namely, the public, what architects could practically do in these matters. Take first the question of dust. As Lord Palmerston said, dirt was simply matter in the wrong place; dust was literally the refuse matter of the furniture and of the traffic of the streets reduced to a very fine powder, and introduced into our houses, in spite of us, by means of all apertures through which the air could force it, and he feared architects could do very little to prevent it getting in. When once it had got in, architects might perhaps give advice. The use of carpets, and hangings, and upholstery, although one scarcely liked to go too far, was certainly to be deprecated, and he thought the time had come in this country, when, apart from the plea of comfort, and what was called snugness, the question ought to be seriously taken into consideration, whether too much upholstery was not used. The architects could do something in respect of their decorations as regarded projections and the like, but not very much. Again,

with regard to the use of polished surfaces, they could do something, but not much ; because the public, he was afraid, did not like polished surfaces. They should be used as far as possible, but beyond a certain extent they could scarcely expect their clients to yield to representations of a purely sanitary character. Obviously, the best preventive of the evils of dust was the cleanliness of the housemaid. You might go into certain cottages in the country, in which everything was excessively dirty, whilst in others, occupied by people of precisely the same class, everything was as clean as could be. He thought the ladies should look after this matter, for after all it was rather more within their province to keep houses clean.

With regard to the second point, he was happy to think that the people of this country were becoming more alive to the virtues of colour. Looking at the matter scientifically, it appeared to him, that colour had a direct effect on the nervous system ; a good effect in some cases, and a bad effect otherwise. It was certainly the duty of architects to regard questions of colour within the dwellings, and also without them, with reference to this scientific principle. Those, who were accustomed to hark back a good many ages, had been astonished to be compelled to admit, that the old Greeks coloured their marble temples. He had held out against that opinion as long as he possibly could, and meant to hold out against it to the end, as far as regards the genuine old Greeks having coloured their temples when the marble was fresh, for he could not believe they did so ; but if they only admitted that the latter Greeks, when the marble began to be discoloured, they not being worshippers of weather-stain as we were, coloured the charming white marble temples erected by their ancestors, that would go a long way to show that we were on the right track at the present day in painting the outside of houses pea-green, Pompeian red, and all the rest of it. It was a step in the right direction, for no doubt the direct effect of colour on the nervous system was either for good or ill, as the case might be.

Mr. EWAN CHRISTIAN did not like the strictures which had been passed on Miss Nightingale, whose 'Notes on Nursing' was a most valuable book, which ought to be in every house in this country, for it was as amusing as any novel, besides being instructive. Miss Nightingale was one who felt the value of light more strongly than almost any one, and in the little book he had referred to, spoke very much to the point upon it. He quite agreed with Professor Kerr that colour should be applied, not only to the inside of the house, but to the outside; that if you wanted to be depressed you could not do better than walk up one of those miserable streets in the outskirts, where the houses were covered with one beautiful tint of compo from top to bottom. There were certain roads which he would never go through for that simple reason. Although there were some amusing illustrations of colouring on the outside of houses in some districts, it was better to see something done than to go on on the old system, and although there might be a good many evils, yet out of those evils some success would probably come. There could be very little doubt that what Mr. White had said was perfectly true with regard to the effect of particular colours, and he would warn those who had delicate eyes to beware of crimson. He was always fond of colour, and on one occasion when he was going away for a week or two, he ordered his parlour to be hung with a crimson flock paper. When he came back he had not been in the room more than an hour before it had such a distressing effect upon his eyes that he had to leave it, and could not endure it again until the whole of the paper had been stripped off.

With regard to the dust, he thought it came within the province of the use of a house, for if houses were not treated with common sense when they were built, evil effects would result. Draperies and curtains, and all such things, were collectors of dust, and therefore injurious, and he had no doubt, if the matting in that room were rolled up, they would all be horrified at seeing the quantity of dirt and dust underneath. Mr. White had suggested that

dust could be avoided by covering floors with linoleum, but on that point he must utter a word of warning, for if a ground-floor room were covered with it, no matter how well it were ventilated underneath, the joists would inevitably rot in the course of a year or two. He had seen this occur in three years on one of the best floors ever laid. Pugging was frequently used for floors, and, according to his experience, builders would often lay the boards over the pugging before it was absolutely dry: if they did that, and if linoleum were put upon the floor, it would certainly be rotten in a very short time. All through life he had advocated, in building schools, that the children should have gardens, in order that they might cultivate flowers, and even in the black country, in Staffordshire, he had recommended the use of flowers in school-rooms, not only for the delight of the children, but in order to teach them habits of order and cleanliness. He had been in most parts of England, and had lodged in a great many places, but he had never found uncleanliness where there were flowers in the windows. If he saw flowers carefully attended to, he was sure there would be cleanliness within the house. Some five or six years ago he became a Governor of Christ's Hospital, and went down to Hertford to inspect the schools there, but having been over the whole of the buildings and their surroundings, he was much disappointed not to see a single flower or garden, and when he went into the dining-room the dulness of it was something awful. He considered it a great shame, that in such institutions something should not be done to brighten the lives of those who had to inhabit the rooms. Colour in a room might be made not only beautiful to the eye, but instructive, by having words of wisdom tastefully printed on the walls, and he should like this wholesome method of decoration to be much more generally carried out than is often the case.

Major ROWE (Sydney) said some eighteen months ago he was requested to go through a large institution in Sydney, where there were some 600 children, to see what could be done to improve it, the floors being positively

worn slight by traffic and over-scrubbing. The boards consisted of American red pine, the joints were open a quarter of an inch, and in some instances more, and filled with dirt, whilst the boards were damp and almost worn out by this constant scrubbing, which he ascertained was done every morning at 5 o'clock. He found the children were troubled very much with croup and ophthalmia, and had frequently to be removed to the adjoining hospital in consequence. He asked the doctor if it was necessary that the floors should be scrubbed every morning? And he said "certainly"; but the secret of the mischief was this constant washing and soaking of the floors, although in a very hot climate, the interstices being positively plugged with dirt occasioned an unwholesome smell, which, he believed, was the reason of the croup and ophthalmia, and yet the medical skill of the institution failed to see what he, as an architect, noticed directly. The floors were relayed with best quality hardwood, clue jointed. He had been astonished to find in the hotel where he was staying in London, that the upper parts of all the windows were fixed, he certainly thought that that sort of thing had come to an end long ago.

Mr. MOSES said he believed there was an Act of Parliament compelling factories to consume their own smoke, and it would be a very good thing if it were more thoroughly put in force. With reference to decoration, he thought nature had shown the way. Nothing pleased him more in London than the great beauty conferred not only amongst the rich, but amongst the poor, by window boxes with flowers. He had never seen this carried out to so great an extent as in London.

Mr. STANNUS said with reference to the question of dry rot in floor timbers, arising from want of ventilation, he had heard that in Lancashire and Yorkshire it was the custom not to fasten down the floor boards until the house had been plastered, the consequence of which was that the house was very much drier, there was a through draught through the joists, and this did a great deal to prevent the danger of dry rot. He did not see why that practice

should not be adopted in the south. It would be very easy to insert such a clause in the contract, and indeed if a little extra were charged it would be well worth it. With regard to the dust, it was obvious that when carpets were used dust must accumulate, and anything which tended to increase the difficulty of getting up a carpet and giving it a good shake was insanitary. The oftener a carpet was shaken the more cleanly would the dwelling be. With regard to the question of colour, it had been the fancy to call mauve and magenta abominable colours; but he believed the man would come who would be able to harmonise those two colours. Looking back to past times they would see what a limited pallet the artist had at first to deal with; and how every fresh colour added to that pallet had almost been a difficulty until some man had arisen who had been able to work it into a colour scheme, and make it harmonize. He believed Mr. Byrne Jones could make mauve and magenta harmonise, and that the time would come when they would be no longer objected to. The question raised by Mr. White's title was a very large one, and divided itself into two branches, the physical side and the psychological side, and he had added a third—namely, a treatise on certain pigments and processes used by various manufacturers, which was very useful as experienced advice. Mr. Christian had given an interesting example of the physical effect of crimson on his eyesight, but the psychological side had to be dealt with; and would form a most interesting subject to anyone who would turn his attention to its investigation. He could not attempt to add anything to what had been said by Mr. Aitchison and Mr. White, and would only express personally his thanks for their very able papers.

Mr. CHARLES said he had been under a very eminent physician in London, who had prescribed arsenic for him, and told him that in Cornwall and the West of England it was constantly taken as the domestic medicine by the people and given to their children, and that no harm could arise from its presence in paper hangings. He should like

some one to explain why, if arsenic were so useful as a medicine, it was to be condemned for house decoration.

Sir JOSEPH FAYRER remarked that with arsenic as with many other things it was a question of quantity. It might be a very useful medicine at times, but there was such a thing as taking too much of it. It was also possible that inhaling arsenic given off from wall papers might have a different effect from taking it as medicine, at any rate it was better that a remedy should be administered under certain known conditions.

The CHAIRMAN said the conference was much indebted to both the gentlemen who read papers, and the discussion had been to him a very interesting one, having dabbled more or less with the question of colour all his life. Mr. Christian had delighted him with his denunciation of compo and cement, and he might have been even more eloquent on that most awful colour or no colour which cement acquired in London smoke. He had parenthetically referred to a matter which was only a less abomination than cement, and that was white brick. Cambridge with all the beauty of its ancient buildings was so infested with white brick in its less academical portions, that the result was something too deplorable; Nottingham, Derby, or the towns in the potteries, had not one-tenth its architectural beauty, but yet the refreshment to the eye of the red brick, compared with the yellow brick of Cambridge, and other eastern county towns, was a thing utterly impossible to exaggerate. One or two points had been touched upon, but not gone into so thoroughly as they might, for instance that of floors. He had had perhaps earlier experience of these matters than almost anyone else, for his father, as they knew, was one of the first pioneers of art decoration, and had a house, now unhappily destroyed, where all the floors were either parquet or else made in a manner Mr. Aitchison had not referred to, terrassed, as they called it on the continent, cement with bits of mosaic stuck in so as to form a plain uniform substance. It was a system which had come down from

the Romans, and was still preserved by the Italians; people called it cold, but it was impervious to damp, and he did not see why the system should not be used under our present hygienic development. Another point which might have been more dealt with was the use of tiles for walls, not white tiles but painted and enamelled in patterns and groups, decorated, for instance, with cartoons from *Punch* or with portraits of one's ancestors. A family portrait enamelled in tiles and inserted in the walls, and the immeasurable artistic development of tiled walls, was a thing only to be indicated for the imagination to run wild upon. It was not enough to denounce dirt, to curse flock papers, to frown on housemaids and deprecate curtains and even blinds—and in that respect he differed from Mr. Aitchison who thought they were indispensable, for he slept in a room without curtains or blinds—but when they have done all that they must go in for better substitutes, and he believed that in composition floors and painted tile walls they would have a wholesome, beautiful, and æsthetic architecture of the future.

Professor T. HAYTER LEWIS, F.S.A., then took the chair.

ON WATER SUPPLY.

THE COLLECTION, STORAGE, MANAGEMENT, AND DISTRIBUTION OF WATER FOR DOMESTIC PURPOSES WITHIN THE HOUSE.

By THOMAS HENRY WATSON.

I HAVE been told it is the custom in parts of India, on the return of the rainy season, for the people to carry to the terrace-roof of their house a large sheet of cotton cloth, and, supporting it on poles, they collect the rain as it falls. Putting a few stones in the centre to cause a depression,

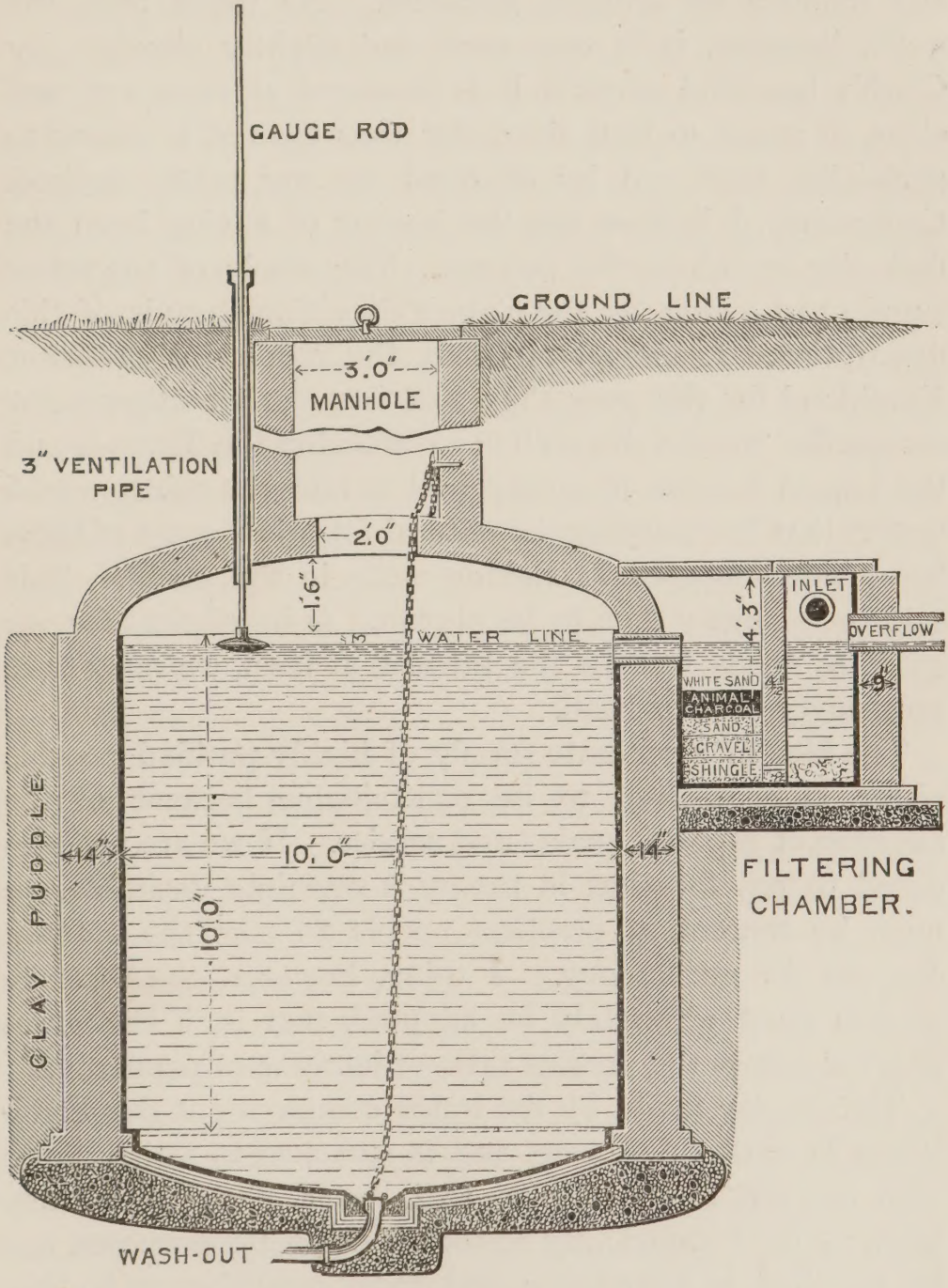
they catch the water in large earthenware pots, and remove them, one after another, as they are filled. A few links of an iron chain are put into each vessel and the contents closed down. They are carefully preserved in the cellar or basement of the house, and protected from the heat against the time when the wells in the city become poisonous and good water is hardly to be obtained.

In England, where a bounteous supply from the same source is poured out all round the year without long intermission, we take no care to collect the rainfall in its original purity, but deal with it only after it has been fouled by contact with unclean surfaces. One usual way is to collect the rain that falls upon the roofs of buildings, and numerous expedients have been adopted for storing and cleansing the water thus collected. I have here a drawing of a tank for this purpose to hold 5000 gallons. This is a suitable capacity for a medium-sized house. Twin tanks enable one to be cleaned out while the other bridges over the time that will elapse before the first is filled again. Settling tanks and filter chambers containing various suitable media do little more than strain the water from the impurities of insect life, soot, vegetable, and other matter in suspension. A very ingenious automatic contrivance has also been recently introduced for separating the first flow of the water with the greater impurities from the cleaner afterflow which is reserved for the tanks. This, however, involves a certain proportion of waste, and the apparatus requires to be kept in order. It is, nevertheless, an excellent contrivance, and should be more generally known. It is called "Roberts' Rain-Water Separator."

Water is drawn from springs after it has fallen on the surface and has been absorbed into the ground. These springs only yield back a limited quantity of the rainfall, and, unless the spring is strong, very large storage tanks have to be employed. I have here the drawing of a tank holding 40,000 gallons for collecting the slow but nearly constant yield of a spring through the summer and winter, and storing it in sufficient quantity for the service of the

gardens in summer time, for the stable-yard, and for fire-mains around a large mansion in Kent.

But our chief supply is taken from the lakes and rivers after it has been contaminated by the organic and inor-



ganic surface impurities of the land, and, in the case of rivers, by drainage from the towns. Enormous trouble and expense is then incurred in attempts to repurify it by filtration, with, of course, but partial success.

One other source of supply is from deep wells in the chalk. This is water that has fallen on the surface, and has been naturally filtered by passing through a great thickness of porous strata. It contains very little organic matter and requires no artificial filtration. As taken from the wells, however, it is very hard and slightly cloudy. By Clark's beautiful process it is rendered at once soft and clear, so much so that the water thus treated is nearer to perfection than can be obtained by any other method. Canterbury, I believe, has the honour of having been the first city to adopt the process. The whole of the water supply to London by the Coln Valley Company is of this description. I understand from the report by Professor Frankland for the year 1833, just issued, that other water companies show a disposition to abandon the Thames and the Lea as sources of supply, and to take the subterranean waters that have undergone natural filtration, some of them being now engaged in sinking wells in the chalk. It is said the quantity thus to be obtained is insufficient for our growing needs, but for the present, at least, we need have no anxiety on that head.

The idea of a separate supply of highly purified potable water is considered to be unattainable because of the expense of separate mains and service. If we are not prepared to pay for what in theory is certainly desirable, we must be content, as practical people, to take the best we can get for our money. I think, however, the separate system must ultimately be adopted, that is, if the great cities maintain the present ratio of increase of population.

The display made by the water companies at this Exhibition is most interesting, and is sufficient to satisfy those who are not too fastidious that water, if not absolutely pure, at least sufficiently so for all domestic purposes, can be supplied in abundance, and under conditions as to time and place most suitable to our requirements ; for example, instead of each consumer pumping, at a great expenditure of labour, the water is delivered at considerable elevations for a very small additional annual charge. This element

of economy is frequently overlooked when estimating the benefits conferred on the community by the water companies.

In all the methods spoken of we are put to some pains to repair our first default, but absolute purity has been lost. That which is poured out with so much abundance will sparkle after it has been subjected to much ill-usage, consequently we bestow no care on it in our houses ; and not until it becomes cloudy, offensive in smell, or nauseous to taste, do we exert ourselves to ask, "What is the matter with the water?" It has been said if we only had to pay for it by the bottle we should know how to esteem it.

The management of the water, after we have collected it and have got it delivered to our house, is the special subject of this paper.

In the Metropolis there are at present two systems of delivery—the constant and the intermittent. The latter is being gradually superseded. Much valuable information on this and many other matters connected with the subject is published in the report of Colonel Bolton, the official water examiner appointed under the Metropolis Water Act 1871. I do not understand that any effectual power is given by Parliament to compel the companies to deliver pure water. What is wanted is not a "standard of filtration" on which the companies may agree, but a "standard of purity and softness" on which the public may rely, and also we want "requirements," framed not exclusively with the object of saving water, but made also in the interests of the consumers, to facilitate the proper management of it within the house, and to ensure the proper cleaning of all cisterns and tanks periodically. The periodical examination of cisterns as to their cleanliness, proper surroundings, and fittings, should be made the work of an independent public officer, acting under the direction of the sanitary authority entirely in the interest of the consumers, whether occupiers of private houses, chambers, clubs, hotels or lodgings.

The great objection to the intermittent service is the

much greater storage required in each house and consequent multiplication of cisterns and tanks, and the inconvenience of having to receive at a particular time the whole supply for twenty-four hours.

The constant service, however, requires fittings much improved on those which have been allowed to be used under the old system. The great hindrance to the introduction of this service is the expense and trouble involved in making the necessary alterations to the fittings to limit the waste of water.

For potable water Colonel Bolton recommends that where a constant service is given, a special supply should be taken from the mains so as to draw off water direct from the works (not from any house-cistern, where it is liable to become contaminated, or at least stale). With the constant service, however, cisterns cannot be wholly dispensed with. An alteration or break down in the mains may necessitate an interruption of the service at any time, and great inconvenience would be experienced if the storage within the house were not sufficient to carry over such a period, be it long or short.

The waste of water that may take place when the fittings are imperfect and the pressure is great, has led to the introduction of a throttle or ferrule into the communication-pipe, lessening the diameter of the water-way to such an extent, that when the pressure is reduced, the water may flow too slowly to be of effectual service. Some storage and a moderate pressure are, therefore, desirable. The constant system, to work effectually and economically, depends upon mutual fair dealing between the Water Companies and the consumers, but it is not easy to adjust things on this basis, and many persons advocate a mixed system. It is, therefore, important to consider the whole subject of cisterns and tanks.

Materials.—Stone, brick, or tile lined with cement, and puddled on the outside with clay, where the ground is porous, are found to be the best materials for tanks of large capacity. Soft water dissolves lime, but cement is not

acted upon by any water. It may be trowelled smooth, and kept clean.

For house cisterns, stone, slate, iron, lead, zinc, and other materials are used. Of these, perhaps slate is best, but it requires to be most carefully fitted and put together with slate cement and metal cramps. Iron rusts badly when alternately wet and dry; enamelled iron is expensive and uncertain, galvanized iron having a mere coating of zinc, which is dissolved by soft water, cannot be relied upon. Lead, of very ancient use, and its modern rival zinc, are also considered objectionable, and should not be used where anything better can be had. I think that stoneware is the best material for the house cistern, and as the constant supply requires only a limited storage, say 100 to 200 gallons, there should be no difficulty in the general adoption of cisterns of this material, provided they are made and fitted in a way that will admit of their proper use.

Reservoirs for spring water require to be fitted with means to aërate the water at the inlet. Large tanks must be thoroughly ventilated; all, without exception, require to be fitted with means to run the water off to the very bottom —this is called "the wash-out," without which they cannot be effectually cleaned. A flap-valve and chain is the proper contrivance for this purpose. Tanks are usually constructed underground; it is sufficient, however, if they be half sunk in situations where the earth that results from the excavation can be heaped around and over them in a mound of sufficient thickness to protect the contents from changes of temperature.

The house cistern requires to be close covered to keep out light, dust, and vermin, and no foul air should by any possibility find access to it. The constant service should enable us to dispense with more than one cistern in any house of moderate size, but if there are more than one the same rules will apply to all. On lifting the cover (which should be kept clean) the whole interior of the cistern should be well lighted and in full view.

Most people would be shocked could they but look in the cistern of their house, but cisterns unfortunately are not usually placed where they can be looked into : the neglect of this is simply amazing. You ask a householder when the cisterns are cleaned out, he does not know. The servant, on being appealed to, only knows that it has not been done since he has been there. I have myself examined cisterns that have not been cleaned out since the house was built though several years have run by. I have found cisterns that could not, by any possibility, be properly cleaned out at any time. I have seen those that have been "done just recently" by an under-gardener, and even a workman, and found them full of vegetable growth, an inch of mud at the bottom, and a quarter of an inch of slime on every side. The cause of this is easily discovered—until lately people had forgotten or had learnt nothing about the necessity for attending to such things, and it is just to admit that the builder, and frequently the architect, had not regarded as important the proper disposition of this part of his work. Cisterns were thrust into any out-of-the-way place, and the plumber was left to arrange his work as it would come easiest for him to execute, without the slightest reference to convenience in the subsequent use of it. Cisterns were multiplied, and the use of the water contained in them varied by subsequent "plumbers' alterations," so that things were brought into the utmost confusion, and discredit has resulted all round.

The system now is, to form a separate cistern room in a cool, light, and well-ventilated place in the upper part of the house ; here the cistern stands just so much above the floor as will admit of the connection of pipes, and give access to it all round. The cistern itself is close covered. The arrangement I make is this—standing in front of it with the cover removed, you see the service cock near the back right-hand corner, a solid tin trumpet waste to take the overflow and form a wash-out, rises from the bottom of the left front corner ; the cistern is fixed a little out of level—the left front corner about an inch lower than the right back corner—

to drain the contents away completely when the waste is out. The proper cleaning and rinsing out of a cistern thus arranged is the work of a few minutes. It is to be done every three or four months. No supply pipe is taken from the bottom. At about an inch from the bottom, the supply to the hot water system is taken; three inches above this level the cold water supply is taken in a pipe of sufficient bore to serve all the lesser branch pipes. The object of this is to let the cold supply fail first in the event of any interruption of the service; there are then three inches in the depth of the cistern reserved for the hot water system until the service is renewed.

The under-waste should be syphoned below the cistern to form a trap: the pipe should be carried to some convenient place in the open air, where the end of it can be readily seen by the Company's inspector; this forms an efficient "warning pipe." At the same time it must discharge in such a way as not to deluge the house when the contents of the cistern is being run off for cleaning.

The regulations issued by the Water Companies are rather misleading. They suggest that every waste-pipe must be converted into what is called an "overflow-pipe," that is a pipe taken out of the side of the cistern near the top, and this so arranged as to act as a warning-pipe. A cistern thus fitted cannot be properly cleaned out except by such an expenditure of time and trouble as is likely to cause it to be neglected altogether. In my opinion this form of waste-pipe should never be admitted. The "wash-out" and "waste," when properly fitted, answer every requirement as an overflow, and the end of this, equally with the other, is an efficient warning-pipe when properly placed in view.

The plumber has been so accustomed to perforate the cistern when in position—considering only how he can best accommodate his work without regard to its subsequent cleaning out—that prejudice is likely to arise against the use of the stoneware cistern. I think the plumber should

give way in this, and cisterns might then be kept in stock sizes, and perforated as follow, viz :

Stock size 3 ft. 2 ft. × 3 ft. = 100 gallons effective capacity.
4 × 3 × 3 = 200 „ „ „

Angles rounded in bottom and sides—glazed brown, yellow, or white inside—provision for service-pipe and waste-pipe as before described, and for two supplies on the right side, near to, but not in the front—the lower one to take connection of 1 in. pipe, the upper one $1\frac{1}{4}$ in.

For drinking-water a separate cistern is recommended. It is not sufficient that this should differ from other cisterns only in being smaller and of a glazed material. Special arrangements must be made in its construction ; these must be determined by a careful consideration of its special use and the means by which it may be kept in order.

My idea is that it should be smooth and white inside, so that no dirt could rest in it undetected ; glazed and rounded, that it might be readily cleaned ; no larger than is necessary, and so shaped that it might be completely emptied and set in order every day ; deep, rather than shallow, with a close-fitting cover going over the top rim no larger than could be safely handled with one hand.

The water required for drinking purposes as water, and in beverages as tea, coffee, etc., is estimated at 2 pints a day for each person ; we may double this during hot weather, and double it again, as we need not be sparing where there is such abundance. I should say that 1 gallon a day for each person would be ample for such a cistern, or say 1 cubic foot for each multiple of five persons in a family, starting at 2 cubic feet as a useful size for a family of ten persons.

This cistern should be fitted up in the pantry, still-room, or any clean cool place in the house ; its front edge should stand on a hard wood drainer, such as is found by the side of the pantry sink. Let the cistern be in full light, accessible in every part of it, and resting on a projecting bracket, which may also serve as a shelf for glasses.

The bottom of the cistern should be rounded and sloping towards the front, where a ground-in porcelain plug should be fitted so as to enable it to be completely emptied. A porcelain tap, the parts simply and easily cleaned, should be immediately over the plug, and should not draw the water quite to the bottom. The overflow should be provided for by a slight depression in the front of the rim, so that any waste may be observed as it flows down in a channel in the front of the cistern to the drainer.

A glass ball-valve, supplied direct from the main, and not from any other cistern, completes the apparatus. This tap may be small, the metal nickel-plated, and the ball and arm must be capable of being turned up out of the way.

With a preliminary swill round and emptying, the plug is inserted, the ball turned down, and the cover put on—the cistern is then charged. Every day, immediately before or during the intermittent supply, it is to be washed out with the remains of the last day's supply, rinsed out with the first of the fresh water, emptied again, and then set in order for the day. This would not take more than two minutes, and for that day at least the drinking water would not be perceptibly worse than that which the Company supplies, while the addition of a pound of washed ice in summer time would give it just that degree of coolness that would render its use the more agreeable.

Of the other cisterns in the house I need speak but briefly. The hot-water tank should not be placed, as it frequently is, near to the cold water to affect its coolness. It is a mere accumulator or reservoir on the hot water circulation, and needs no special fitting beyond a manhole for occasional cleaning. It is best placed in the bath-room, or in a linen room, where some of its heat may be utilised in a drying closet.

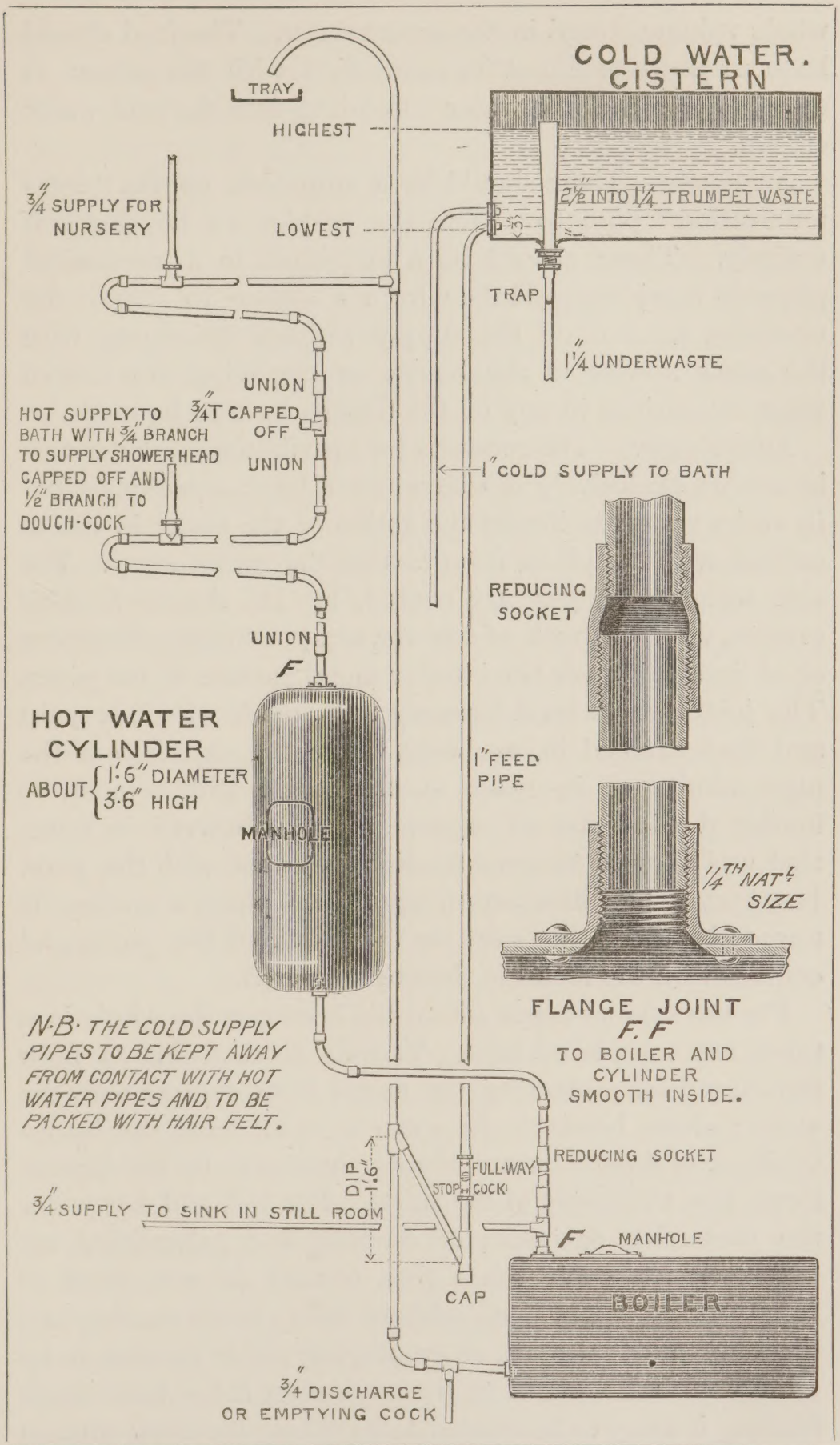
W.C., urinals, &c., require waste preventor cisterns. All those in use need improvement. The principal objections are that the incoming of the water is attended with noise,

this may be obviated by taking the delivery nozzle down nearly to the bottom of the cistern; also the noise and want of force in the flushing of the closet. The valve should be contrived near to the pan, so that a column of water is standing above the valve ready to act the moment the valve is opened.

Where there is an open boiler a feed cistern is required. It has been the practice to put this in a dark cupboard, generally near the kitchen range. For this there is no necessity. It may be placed in any open light place where it can be got at all round; it only needs to be on the level of the boiler. It must have a close-fitting cover, and be kept quite clean. Stoneware is the best material for this purpose.

Too great a pressure upon pipes and fittings causes waste of water. It is advisable, in determining the place for the cistern, to arrange that the pressure does not exceed that which is due to about 25 to 30 feet head of water. In houses of many stories, with the hot water system, this difficulty cannot be met, and a great want is a really efficient hot water high-pressure tap.

In regard to the management of hot water there are two or three points to be observed. The flow-pipes should always be fitted to a flange joint on the top of the boiler and of the accumulator, the inner surface of which should be smoothly rimmed to prevent the formation of an air trap — the cause of the thumping and vibration often experienced. The flow-pipe should be of larger bore for a short part of its length immediately over the boiler, especially when the water is hard and much deposit is formed at the mouth of the flow-pipe. All supplies should be taken from the flow above the accumulator so as to draw the hottest water. Very short branch pipes should be admitted to hinder the dead water becoming cold and causing waste. The return should take the shortest course to the lower part of the boiler; the feed-pipe should be entered into the return so as to deliver the cold water direct to the boiler and not reduce the temperature of the


COLD WATER. CISTERN
TRAY
HIGHEST
LOWEST
3/4" SUPPLY FOR NURSERY
2½" INTO 1¼ TRUMPET WASTE
TRAP
1¼" UNDERWASTE
UNION
HOT SUPPLY TO BATH WITH 3/4" BRANCH TO SUPPLY SHOWER HEAD CAPPED OFF AND ½" BRANCH TO DOUCH-COCK
3/4" T CAPPED OFF
UNION
1" COLD SUPPLY TO BATH
REDUCING SOCKET
UNION
F
HOT WATER CYLINDER
ABOUT 1'6" DIAMETER 3'6" HIGH
1" FEED PIPE
MANHOLE
1/4TH NAT. SIZE
FLANGE JOINT F. F
TO BOILER AND CYLINDER SMOOTH INSIDE.
N.B. THE COLD SUPPLY PIPES TO BE KEPT AWAY FROM CONTACT WITH HOT WATER PIPES AND TO BE PACKED WITH HAIR FELT.
REDUCING SOCKET
DIP 1'6"
FULL-WAY STOP COCK
3/4" SUPPLY TO SINK IN STILL ROOM
F
MANHOLE
CAP
BOILER
3/4" DISCHARGE OR EMPTYING COCK

whole volume stored in the accumulator. The feed should have an elbow or dip at its connection with the return so as to hinder the hot water ascending into the cold water cistern.

Stop-cocks.—There should be a stop-cock on the "communication" pipe to enable the service to be shut off entirely. There should be a stop-cock in a convenient place on every supply taken from a cistern, to enable the workmen to shut off the supply without interfering with the other service of the house, or emptying the cistern when alterations in any of the fittings have to be made.

Distribution.—The conduits for distribution of water now in use are exclusively of iron when of large capacity, coated in various ways to hinder the action of the water in direct contact with the pipes, from rusting the metal away. For soft water the pipes are coated, by Dr. Angus Smith's process, with a varnish of coal tar, or by a coating of cement or of lime paid over the interior metal surface of the pipes. The joints which used formerly to be made with tow yarn and lead caulked in, are now, where the capacity of the pipe admits of it, made on the inside with cement, to hinder the increase of organic matter observed in water that was allowed to come in direct contact with the yarn. Hard water has little action upon iron pipes, a coating is formed by the earthy salts on the inside of the pipes, and contact with the metal is thereby hindered.

For the smaller pipes within the house, on the whole iron tubes are considered best. Various processes have been introduced for protecting the metal from contact with the water; where, however, the water is at all hard, the inconvenience of direct contact is soon overcome by the deposit formed on the inside of the tubes. For soft and hot water the protective processes of Barffing and galvanizing are frequently used, but tubes thus treated do not admit of being worked up, or bent, without injury to the coating, and the only effectual way of employing either process is by taking down the whole of the work after it has been fitted, sending it away to be treated, and refixing the work without

any alteration whatever, this becomes an expensive matter as the cost of labour far exceeds the value of the tubes. Wrought iron may be artificially coated with a deposit of lime after fixing, and, when kept well painted on the outside, tubes of this material are perhaps the best and most economical for hot water work.

Lead in pipes is less objectionable than in cisterns, because these require cleaning, consequently the surface is liable to be exposed to fresh action of the water. Both hard and soft water generally form a coating on the inside of lead pipes, the latter by a vegetable matter, which appears to combine with the oxide of lead, and protects the water from contact with the metal. The facility with which lead can be worked, its strength, durability, and fewness of the joints required, cause it to be preferred for house-work. It is reassuring to be told by those who have made observations, that the action of water upon lead pipes is very slight when the metal is tarnished—a condition that is attained soon after manufacture—and under all circumstances is so slight as to be immaterial. Lead pipes have been made with an inner lining of pure tin. The practical objection to tubes so lined, is that they do not admit of the ordinary plumber's joint, consequently their use is limited. Pure tin is the only material to use when difficulty is experienced with other metals, and expense does not stand in the way. Copper, tinned copper, and galvanized iron, are not recommended.

It is important in the economical arrangement of the water-service of the house that those offices which require water-supply should be grouped together as much as possible—a point, unfortunately, too frequently overlooked, although easy of attainment when attention is given to it at an early stage of the plan.

Thus, a bath-room is to be preferred that is over a pantry, rather than one that may be more conveniently arranged on the bedroom-floor over a principal room of the house. The disposition of closets, lavatories and sinks, should follow this rule, the pipes may then be exposed and

painted to suit the wall-surface, not cased up by joiner's work, nor hidden under floors, as is too frequently done to get them out of view, when they have to be carried through apartments in which their appearance is not expected.

DISCUSSION.

Sir JOSEPH FAYRER said, he was not aware until he came into the room of the exact nature of the paper, or he would have provided himself with certain details of information which might have been interesting; as it was, he must trust merely to his memory. Mr. Watson's paper was a very valuable and practical one, dealing with engineering arrangements for the distribution of water, and he was glad to find that he had called attention to the ignorance which generally existed on these matters. On a former occasion, when the question of water was discussed, he had expressed a doubt whether anyone present knew where the water tank in his own house was, much less if he had any conception of its interior condition if he looked into it, but it was of peculiar importance at a time like this for everyone to look after the condition of the water they were drinking. He did not wish to be understood as anticipating any impending evil, but in the presence of the great epidemic which had no doubt reached Europe, they should be prepared to meet it if it came, and there was no better or more certain way to deprive it of its hurtfulness than in attending to the purity of drinking water. Allusion had been made to a simple method of collecting water in India, but he might say it was not special to that country, for the same thing was done wherever there was a difficulty of obtaining water from springs or rivers, or where it might be more convenient to collect it in that simple manner. In some parts of the world the people were almost entirely dependant for drinking water on that which fell from clouds. For instance, in the island of Bermuda it was almost all

collected in that way, and kept in large tanks which were kept whitewashed and scrupulously clean. In Aden, the rain, when it did fall, which was very rarely, was collected in the same way and preserved in tanks; for the most part, however, they were dependent there on sea-water which was distilled, though there was a very imperfect supply of impure water which flowed from a small stream some distance from the settlement. No subject was of more importance with regard to the health of the people in India than the supply of water. During the last half century or less, a great improvement had taken place in the hygienic and sanitary conditions not only of the Europeans, but of the natives of that country, and from the statistical returns which had been relied upon, such as those referring to our European troops, the inmates of jails, and so on, it had been clearly proved that the mortality had been greatly diminished, having been reduced from 50 or 60 per thousand to 20 or 25. That had entirely been accomplished by sanitary science, and it was mainly owing to the improved water-supply. He referred not only to the water for drinking, but to the removal of subsoil water, and preventing stagnation, so as to diminish the amount of malarial poison. Most of the great cities in India were now fairly well supplied. In Calcutta, within a few years, a liberal and extensive water-supply had been provided, the water being brought from the Hooghly, from a distance of 18 or 20 miles above Calcutta, collected in large filtering tanks, and then distributed by mains. In some parts of India, where malaria was very prevalent, and in fact, there were few parts where it was not, though in some districts it was more severe than in others, people very commonly collected water in the manner described by Mr. Watson, because they knew that if they drank water from tanks or pools, they would get fever. They believed that if they drank such foul water they would take with it the particular poison, whatever it might be, which caused that condition which in ignorance of its real nature was designated malarial fever. At all events, the purification of water was always

a matter of importance, and he knew of no country in the world where this had been more thoroughly proved than in India. He knew very little of the subject as connected with this country, but the main conditions must be the same here as elsewhere, and therefore he felt they were much indebted to the author of this paper for bringing the subject forward.

Mr. GRANTHAM said he believed there was an attempt made in London some time since to get another supply from the chalk, altogether independent of the Thames, but it would have been difficult and expensive, and he believed it was given up. Mr. Watson had very clearly laid down the rules for the introduction of water into houses, and also its distribution. There was one point of practical difficulty with regard to the legislation, because the law only went to the providing of proper water, it did not refer to pure water, and it was very difficult to say what proper water meant, one of the most important points was that drinking water should have a separate cistern, into which no pipes were allowed to enter. Hot water pipes were often a great trouble in a house. Some time ago he put on a very pure supply of water to a large country house, which was from the green sand; he only brought the supply to the outside of the house, but unfortunately the owner set about distributing it all over the house with galvanised pipes, and in the course of about two years several of them became totally stopped, by the rust deposit which had fallen down the interior to the bottom and entirely choked the pipes. There was a great prejudice against leaden pipes, and it took some little time before that coating, which Mr. Watson alluded to, will be formed inside and will prevent their being injurious. Some waters affected metals more than others, and the best waters were often the worst in this respect, particularly in their action on lead.

Mr. SCHMIDT (Eastbourne) remarked that it was very annoying in winter to have water-pipes bursting and destroying all the decorations of a house, and he found by practical experience that it was not always safe to depend

on the stop-cock, which, in the majority of cases, was placed outside the building, was not attended to, and when winter came, with perhaps several inches of snow, no one knew where to find it, and when it was found it was frozen or immovable. It was much better, therefore, to place the stop-cock inside the house accessible to anyone, and to prevent the water in cisterns coming down, to hang a plug on to a crank, which you could bring down by a wire so as to stop the flow of water into the service-pipe which distributed it over the branches, and then you could empty the pipe at once. The usual flushing cisterns to outside closets were too small, and in the winter they were comparatively useless, because the ball-cock froze up, and there was no water for flushing purposes. It was far better to have the cistern in some accessible place in the house for cleansing purposes. At Eastbourne, thanks to the liberality of the Duke of Devonshire, they had a very pure supply of water, the works had been lately extended, and they had a special Act of Parliament, called the "Eastbourne Improvement Act, 1879," which required every new building to be specially inspected, and until the certificate was given by the building surveyor it could not be inhabited. The death-rate there was 13 per thousand, and the water had 9° of hardness.

Mr. EWAN CHRISTIAN said when he was in Venice forty-two years ago, he was curious to know how the tanks under those beautiful bronze well cases were constructed, he went, therefore, to the Board of Works, and they kindly explained to him the system of filtration. It was simplicity itself, and ever since that time in every place where he had provided a tank for general use he had adopted this system. All you required was a tube or drain 5 or 6 feet long, with a door at the top which could be easily opened, with an inlet pipe at one end and an outlet at the other; at the bottom there were 6 inches of sand running all the way through. Then partitions of perforated slate, and over these on the inlet side a layer of coarse gravel, and on the outlet side a layer of fine pebbles, with a dip-stone in the

middle. If after six months' use, you opened the doors you would find a black mass on one side and perfectly pure water which flowed into the tank on the other. All you had to do was to take the sand and gravel and pebbles out and wash them and put them back again. With regard to cisterns, most architects knew that in the city of London there were a number of beautiful cisterns in houses 150 or 200 years old, most of them having the date upon them. There were some in the neighbourhood of St. Paul's. He had always been curious on the subject of the action of water upon lead, and had looked into these, and had never found any deterioration whatever. He was also present in Canterbury when the thick lead pipes in the Cathedral Close were taken up, and he carefully examined them and found they were as perfect inside as the day when they were laid down; on the other hand, he put up a milled lead cistern for a very good quality of water for a house in Lancashire, which was entirely destroyed within a year; of course no one could have drank the water out of that lead cistern without suffering from it. That water was drawn from a well in the red sandstone 60 feet deep. He had had exactly the same experience at a house near Godalming. He had also had a great deal to do in the neighbourhood of Ascot, and there it was impossible to use lead either for cisterns or pipes, the water having precisely the same effect. He had not ascertained the exact quality of those waters, but as far as his experience went soft rain-water would not act in that way. It was all very well to recommend the water being drawn direct from the main, but in London that plan could not be acted upon; and with regard to putting the stop-cocks inside the house, the water companies would not allow it in the neighbourhood of London. He would recommend that hot-water cisterns should be put in linen closets, the benefit of which plan he had proved in his own house and many other instances.

CHAIRMAN'S CONCLUDING PAPER.

PROFESSOR T. HAYTER LEWIS, F.S.A.

THE three papers which have formed the base of this day's discussion have been on various subjects, and these have been well treated at different stand points by the several speakers. But all agree in this, viz., that whether the object be efficient water supply or healthful-building, if you have good work and good materials, so as to make sure that the joints will not leak, the boards will not gape, nor skirtings shrink, nor crevices be left where they ought not to be, and if this good work be well and cleanly kept, then the result is healthful. With bad work, bad materials, uncleanness—*un*healthful. But the authors go beyond this, and the inference from their reasoning is clear, viz. that beauty of form and colour may be valuable agencies in our favour, and must be studied too, as being as healthy to the mind as they are pleasing to the eye.

To use the words of our great authority, Dr. Parkes, "Hygiene—signifies rules for perfect culture of mind and body. It is impossible to dissociate the two." Now I take one case, dwelt upon by Mr. Watson, in which decoration may be a valuable agent to us, and I especially note this as one in which the employment of art would appear, at first sight, to be absurd, I mean your water cisterns.

If I might ask the question without impertinence, I should like to know how many of you have ever seen the interior of your cisterns or filters, upon whose cleanliness the health of your families depends. Ugly things, looking at the best like packing cases roughly put together, they

are stowed out of sight as unclean things to keep company with spiders and their cobwebs. And though they may be examined by your plumber, he may be like Mr. Spurgeon's *un*converted housemaid so touchingly described by Mr. Aitcheson, and your cisterns be no better for his cleaning. But do as our forefathers did with cistern and conduit alike—use the same taste which they employed, but on such good materials as they had not—terra-cotta or stone-ware such as Doulton, or Cliff, or Wilcock could make and decorate, and you may then place them where they would take rank with other fittings of the house, and, being before your eyes, all uncleanness could be detected at a glance.

Not less clear is the influence of art on health in decoration for our walls, as shown by Mr. White, and well pleased I am to know that in our newest hospitals the ghastly pallor which once was common on their walls, is giving way now to healthful decoration. Nor can the revered name of Florence Nightingale be quoted against this, inasmuch as although she states, in her 'Notes on Nursing' that the best wall for a sick room is pure white, non-absorbent, cement, or glass, yet she expressly adds *or glazed tiles if they were made sightly enough.* And she further proceeds to state that the sight of cheerful colouring is of great benefit to the patients, and is not only good for the mind but for the body too.

What was there in the ghastly white or the sickly yellow or cold blue to cheer the wearied patients, sick with illness and worn with pain. But let the artist lend a helping hand. Let him put upon that bare wall something to take away his thoughts from himself, and in doing even the simplest work, the artist may prove himself to be of no slight help in the great work of healing.

I have now to declare that this week's conference is about to close ; and as it has been conducted under the auspices of the Royal Institute of Architects, it may be well that I should offer a few remarks respecting the part which the Institute and its various members have taken, from

time to time, towards assisting in and bringing forward, prominently, the various questions of sanitary science, and the better housing of the poor and rich alike. The history of the movement which has resulted in the present Health Exhibition is briefly this. Some forty years ago, Mr. Edwin Chadwick published his report on the sanitary condition of the labouring classes, and this was soon followed by the establishment of the society for improving their condition.

In 1847, for the first time, householders were compelled to drain into the sewers. Shortly before this time the Institute came into vigorous life, thanks mainly to our dear friend Professor Donaldson. In 1839–42 its first volume of Transactions was published, and amongst its articles are some on sewers, damp in foundations, hollow walls, warming and ventilation, filtering water and artesian wells. All these were, of course, in addition to the valuable papers by Professor Willis and others on fine art and construction, and it furnishes, I think, a convincing proof of the interest taken by us in sanitary matters, at that time, no doubt, imperfectly studied.

It would be simply wearisome to give a lengthened list of the papers which have, since then, appeared in our Transactions, but I may be allowed to mention a few which have appeared in them and in other places from our members.

In 1850, Mr. Roberts read a paper on the dwellings of the labouring classes, which has since been expanded into his well known book on that subject.

In 1851, we had the important subject of smoke-consuming, brought forward by Mr. Stevens.

In 1852 Messrs. Ashpitel and Whichcord produced a valuable paper on baths and wash-houses, and in the same year on the arrangement of houses in flats—a mode of building which is now, at last, coming into use, and which was investigated, at a much later period, with great care by the present secretary of the Institute, Mr. White.

In 1854 Mr. George Godwin published his well-known

'London Shadows,' a work which did much to rouse public attention to the housing of the poor.

In 1854 there was read by Mr. Boulnois a paper on drainage, the discussion of which extended over three evenings, and will always be consulted as giving a clear account of the state of knowledge on the subject at that time.

In the same year Mr. E. C. Robins, one of the honorary secretaries of this Conference, who was then honorary secretary to a Local Board of Health, published his 'Practical View of the Sanitary Question,' a work which had a good practical result in many ways.

Amongst other subjects relating to Health we have had the following treated at considerable length, taking them in the order of date:—Hospital construction, abattoirs, artisans' dwellings, house construction, heating and ventilation, public health, theatres, water supply, and model bye-laws; and I conclude my list with a paper read a few sessions back, by Mr. E. C. Robins, on sanitary science in its relation to civil architecture, the discussion upon which, carried on by some of the most eminent men in various professions, occupied three evenings. For in all discussions at the Institute we invite the freest comments, not only from our own members, but from any visitors who can throw light upon the subject, whether their views are in accordance with ours or not.

We thoroughly acknowledge the great service done for the work by eminent men in other professions; we gladly accept their most valuable help, and we feel bound to keep well abreast with them in their scientific work, and to bring the results of their labours into a tangible form. To bring them in the most practical way before our younger brethren, we have made it compulsory now for each associate before he is admitted into our ranks to pass an examination in which the leading principles of sanitation form a prominent feature. And it will serve as an encouragement to them in the pursuit of this knowledge to know that our past vice-president, Mr.

George Godwin, has recently had presented to him by Her Majesty, at our recommendation, her gold medal, for his long, zealous and able advocacy of the work in which we are all now engaged.

Before I conclude, I must call your attention for a few minutes to a fact which is constantly overlooked, and the omission of which is often made to bear somewhat hardly upon us architects, although it should, really, bear much more heavily on the speculating builder, viz., that whilst sanitation has been erected into a science within a comparatively short time, most of the houses in which we live have been erected a comparatively *long* time, and though the sanitary details of the best houses erected even a few years since may now appear to be, and often are, very defective, as judged by our present state of knowledge; they were, when put up, very probably up to the state of knowledge at that time possessed. To give a clear example of what I mean, I will take the case of typhoid fever, whose special properties were not known forty years ago, and whose origin in foul air is a still later discovery. But foul air was, nevertheless, always sufficiently offensive, and a thing to be fought against, and, a few years back only, it was the belief (I might almost say the *universal* belief) that a well-constructed water-trap was an effectual preventive to its entry into the house. Now it is known that foul gases will pass this water. That they are absorbed on one side of the trap and given out on the other, this process going on continually, and hence it is clear that no water-trap is, of itself, effectual, and that we must apply ventilation to assist its action. Again, as to the form of these traps. It used to be thought that the D trap was the best form, but now it meets with few friends, an eminent sanitary engineer, Mr. Rogers Field, even condemning it as a terrible offender.

The progress of knowledge, and the difficulty of keeping pace with it is curiously illustrated by Professor Corfeld in his 'Common Defects in the Sanitary Arrangement of Houses.' He says (to give a short abstract) the form of trap

which was used first in connection with water-closets was the siphon, which was afterwards discarded, but which we now praise, and the trap which supplanted it was the D trap, which we are now condemning, and taking out whenever we can." I might say the same with other details and other materials, as—*e.g.* drain pipes, which were not made socketted until between 1840 and 1850, and whose use was, subject to much doubt, even so late as 1854, as is shown by the well-known reports on the drainage of Sandgate and other towns. But most houses, even of the best class, built before that date, were, with few exceptions, built with brick drains, simply because no other material was then generally known, and though brick drains and D traps are none of the best things to have in your houses people shrink from the annoyance of having them disturbed, until illness or some other cause requires it.

Then an outcry is, of course, raised against the antiquated use of these things, the cause being simply that they were when the houses were built, the best form and materials known. Sanitary science has advanced since then, but the houses have, of course, stood still.

It is by no means unlikely that, in a few years, another discovery, viz., that of Pettenkofer, may effect a very considerable modification of both the external and internal finishings of our dwellings. His theory of the filtering of air through our walls and floors has not yet been thoroughly worked out, but it evidently has a very important and quite unexpected bearing on their construction. It is our province to consider, with the greatest care, the bearings of this and other discoveries worked out in the laboratory, and which we have to work out on a grand scale in our buildings; and I trust that we shall not be found wanting.

Finally, I have in the name of the Institute to thank those gentlemen who have undertaken the arduous task of working out the details of this Conference, and those ladies and gentlemen who have taken upon themselves the labour (and in many cases, I know the serious inconvenience) of

coming here, to take part in it, and I will express a confident belief that the good work which the Royal Prince who suggested this Exhibition, and the zealous men who have aided so heartily in carrying out his suggestions, may bear the good fruit which it so thoroughly deserves.

PROMOTION OF SOCIAL SCIENCE.

CONFERENCES ON THURSDAY and FRIDAY,
JUNE 26th and 27th, 1884.

PROGRESS OF SANITARY LEGISLATION IN GREAT BRITAIN.

WHAT CONDITIONS ARE ESSENTIAL FOR A HEALTHY DWELLING.

RESTRICTIONS AS TO THE EMPLOYMENT OF GIRLS AND WOMEN IN WORKSHOPS AND FACTORIES.

SHOULD NOTIFICATION OF INFECTIOUS DISEASE BE OBLIGATORY?

LEGISLATION RESPECTING THE DUTIES OF MEDICAL OFFICERS OF HEALTH.

Conference on Thursday, June 26th, and Friday, June 27th, 1884.

Sir Richard Temple, Bart., G.C.S.I., C.I.E., D.C.L., LL.D., President of the Social Science Association, in the Chair.

SUBJECTS FOR DISCUSSION:—

1. "*Progress of Sanitary Legislation in Great Britain.*" By Francis S. Powell.
2. "*What Conditions are Essential for a Healthy Dwelling, whether in an Urban or in a Rural Locality; and how far is it desirable that they should be rendered Compulsory by Legislation?* By H. H. Collins, F.R.I.B.A., M.S.I., &c., &c.
3. "*What, if any, Restrictions in the Interests of Health should be enforced in connection with the Employment of Girls and Women in Workshops and Factories?*" By J. H. Bridges, M.B.

PROGRESS OF SANITARY LEGISLATION IN GREAT BRITAIN.

By Francis S. Powell.

A Past President of the Health and Education Departments of the Social Science Association.

I have written as the title of this paper the words "progress" rather than "history of" sanitary legislation, because history is a tale of the past; while progress suggests movement and advance. Not that the legislature will soon have many new tasks. It is to wise administration rather than active legislation that the efforts of sanitary reformers must now be directed. But the vigilance of Parliament must not relax, and public opinion should exercise such

control over central and local authorities as may secure an effective execution of the comprehensive statutes which exist.

The Statute Book bears record that during many centuries the nation was in some measure, according to the knowledge of those times, alive to the necessity of protection against nuisances and other conditions dangerous to health. But it is only since the commencement of this century that Parliament has passed Acts of wide range. This century, indeed, must always be remarkable for the rapidly increasing density of the population, for the insanitary conditions incident thereto, for the energy and knowledge applied to the diminution and removal of those conditions, and, lastly, for the stringency of the statutes dealing with this class of evil. Successive epidemics created alarm, and it has been well observed that the visitations of Asiatic cholera were the causes which forced upon the mind of the country the necessity as well as the duty of thoroughly investigating and legislating upon matters relating to the public health.

It was in the rising communities now first becoming towns, and populations rapidly thrown together under circumstances of employment and habitation most unfavourable to health, that the need of amendments on an effective scale was first felt. This conviction produced a remedy of a rude but practical character in local acts dealing with the mischiefs which were most injurious. Then followed commissions of inquiry, that of the Duke of Buccleugh in 1845, being entitled to the distinction of having led to the most important enactments. The General Board of Health, constituted in 1847, was the first central authority. Then followed a series of general statutes. By the year 1870 the number of these statutes—to say nothing of special and subsidiary acts—creating authorities and boundaries, and rates and powers and duties, had become intolerable, and escape from hopeless confusion was sought in the labours of Lord Norton's Sanitary Commission. That Commission, on which I had the honour to serve, endeavoured to devise remedies which could be applied. While the

schemes of many Commissions have perished on the rocks of an abstract philosophy, Lord Norton's Commission hoped to obtain valuable reforms by amendments which Parliament might reasonably be expected to sanction. And Parliament did sanction those amendments. Few recommendations have failed to find a place on the Statute Book. Many were carried out by Acts dealing with special branches of the subject, and preparatory to a comprehensive measure. In the year 1875 Parliament passed an Act, consolidating and amending the law for the most part in accordance with the suggestions of the Commission. This Statute, known under the name of the Public Health Act, was introduced by Mr. Sclater Booth. Nearly ten years have since elapsed; and those most fully acquainted with the subject will fully endorse my opinion, that few amendments of moment, and within the range of possibility, have been suggested. Some seek after higher things, but we had to deal promptly with urgent wants, having ourselves but limited opportunities, because dependent on Parliament for our success. Such were the conditions of the problem, and it is no presumption to say that few statutes of so wide a scope have so long and so well stood the test of criticism. There are, doubtless, defects which experience will disclose, some which new circumstances will of themselves create, others of so minute a character that a new consolidating Act will in due course, and without difficulty, remove them. Under the Act of 1875 much which was permissive is made compulsory; there is one authority, and one only, for public health purposes in every place, instead of sundry authorities with uncertain, and possibly conflicting powers; while one central authority presides over both the Sanitary and the Poor Law authorities throughout the country. The powers and duties of both central and local authorities were carefully revised, and the whole was brought within one statute.

Complaints have been made respecting want of power. It is by no means certain that this complaint would in all cases survive a careful perusal of the statute and acquaint-

ance with the stringent enactments contained in those three hundred and forty-three sections of the Public Health Act.

The Commission determined to retain a difference between urban and rural powers. I confess that further observation and experience have confirmed me in the opinion that powers which are necessary in dense populations would be intolerable in rural districts. It is not sufficient to rely on the due adaptation of bye-laws to the special character of the district. Bye-laws have an increasing tendency to uniformity, and there is some ground for the remark that in the judgment of officials in central authority, it is the fault of the district, not of the bye-law, if the model code proves ill-adapted and oppressive to the locality.

The statute does, however, contain a provision for conferring, with greater or less completeness, urban powers on rural authorities—a provision which has enabled districts to obtain the advantages without experiencing the inconveniences of urban powers. It is a satisfaction to me, as the author of this provision, to observe the results. Before May, 1883, 444 orders conferring these urban powers had been issued, and these districts have thus obtained by a simple procedure the benefit of any urban power which their circumstances require.

In collateral and subsidiary subjects improvements have been made which are based upon suggestions made by this Commission. The law for the registration of births and deaths has been revised, the old corporations are being reformed, and improvements are now effected in the management of local finance.

Reference must now be made to other details of legislation in relation to Public Health. There are places where work is conducted under such circumstances that legislative enactments have been found necessary for the regulation of labour. Such are mines, where protection against accident is afforded by the Mines Regulation Act; such are factories and workshops, where security against excessive hours of labour and unhealthy conditions is provided by the Factories Act; such are canal boats, where

adequate provisions against overcrowding are made by the Canal Boats Act.

The sections of the Public Health Act which will first demand reconsideration are probably those which relate to offensive trades. Meanwhile one trade, of such importance to this country that Lord Beaconsfield, in a memorable passage, made it the test of national prosperity, has been brought under more stringent control by Parliament. The Alkali, &c., Works Regulation Act of 1881 imposed severe restrictions on the conduct of alkali works, and what may, in general terms, be described as chemical works. By the operation of this Act, 976 works were registered up to the close of 1882; and there is good reason to hope that the sections of this Act, and the action of the Inspectors under it, will restore vegetation to wide districts which were blighted by noxious emanations, and render them once more such that the inhabitants may dwell therein without suffering inconveniences destructive to comfort and the enjoyment of life.

After prolonged inquiry by well-constituted commissions and committees, the Act for the Prevention of the Pollution of Rivers was passed in the year 1876. The increasing pollution of our streams was not only destructive to human life, but threatened the destruction of the rivers themselves. Describing the condition of the Irwell in 1870, the Commissioners report that "the result is seen in great shoals of black mud and ash appearing at various points in the occasionally diverted course of the river (as when a great spoil-heap on one bank sends the water with increased force against the opposite side below), and in the gradual rising of the river-bed, which in flood time thus raises the level to which the injury then suffered by river-side towns and villages extends." This Act contains an absolute prohibition against putting or permitting to fall solid matters into streams, with qualified prohibitions against the "fall or flow" of sewage matter into any stream, and against the "fall or flow" of any poisonous, noxious, or polluting liquid from any factory or manufacture into any stream. There are special regulations for mines, in consequence of cir-

cumstances attending those industries. Successive reports of the Local Government Board bear witness to the effective working of the Act as regards authorities under the jurisdiction of that Board. The sections relating to matters not within the cognizance of that Board have doubtless had a like effect. Evils silently endured when no remedy existed, are now attacked with success: such success encourages others, and an active public opinion throughout the country is steadily and certainly restoring the purity of our streams, is removing dangers to the health of those living on the banks, and is once more enabling the channels to discharge the waters by a continuous flow.

Much yet remains undone, and neither writers nor readers have any reason to congratulate themselves that the most difficult problem—that of the Thames valley—is satisfactorily or finally solved. Even as to the provinces there is still reason for resting satisfied with the present condition of affairs. Progress is being made, but public opinion does not as yet act with sufficient energy.

During the last ten years, as always, water supply has occupied the attention of the legislature. Liverpool and Manchester, to say nothing of cities having less importance, are now engaged on schemes of gigantic magnitude. The provisions of the Public Health Act have been supplemented by the Act of 1878, which was introduced to Parliament by Mr. A. Brown. This statute makes it the duty of a rural sanitary authority to provide or require provision of sufficient water supply for each occupied dwelling, and forbids the occupation of any dwelling in a rural district erected after the date of the Act, or reconstructed after being pulled down to the ground-floor, until the granting of a certificate that there is a sufficient supply of wholesome water within a reasonable distance of the house where the same can be provided at a reasonable cost.

It cannot be regarded as certain that our countrymen are as yet duly impressed with the necessity of obtaining an ample supply of wholesome water, or of guarding from contamination the water when supplied to each house.

In the year 1879 an additional enactment relating to the

adulteration of food received the sanction of Parliament. It is deeply to be regretted that the administration is here so much in fault, and that therefore these Acts are not effectively put in force. In too many cases the authority is negligent, or the means used for detection are scandalously imperfect; and, greatest evil of all, the magistrates show reluctance to convict, and after conviction impose penalties wholly inadequate to check violations of law by which the offender gains considerable profit.

Parliament in its vigilant wisdom watches small things as well as great. In 1879 a penalty was provided for cases in which any child under the age of fourteen years takes part in any public exhibition or performance whereby the life or limbs of the child may be endangered, and finally the Fruit Pickers Lodgings Act, 1882, enables any local authority to make bye-laws for securing the decent lodging and accommodation of persons engaged in the picking of fruit and vegetables.

The metropolis has been excluded from the above review, because the enactments, like the wants, of London are so special and complicated that a separate paper would be required to give any adequate explanation; and further, because London in sanitary, as in so many other reforms, is in arrear, not in advance. The Public Health Act of 1875 abolished complications, amended defective provisions, and generally consolidated the law. The vestries in 1876 rejected a like measure for the metropolis; and to-day, in a year when they are put on their trial, have to give such account as they best may for a course of action which perpetuated in London a confusion and entanglement from which the provinces were emancipated in 1875.

Since the Statute of 1875, as before that date, Local Acts, amending in one view, confusing and obliterating in another, the General Law continue to be passed. They have arisen, in many cases, from an exaggerated sense of the peculiarities of the town, or a desire to make minute provision by statute instead of bye-law. For some populations it must be admitted that a convenient code in one

statute has been thus provided. These codes would be more capable of defence if supplementary acts for the same town did not so soon rob them of that comprehensive character which is their best justification. For our great towns precision and directness have not been attained by Local Acts, inasmuch as their number and complexity so often reduce the whole to a chaotic state. These Local Acts are unsound in principle, because sold by Parliament for fees; and because in practice, at any rate, they cannot be amended without the employment of legal assistance, which is itself a source of expense. Some superintendence has been exercised over them by Lord Redesdale and by the Local Government Board. But the House of Commons has now adopted a more effective means of bringing under some system the irregularities, the eccentricities, almost the whimsicalities, incident to this class of Bill. These Bills are now referred to a Select Committee when promoted by local authorities to create powers in relation to police and sanitary regulations, which deviate from, or are in extension of, or repugnant to the General Law. The Committee is instructed to make a special Report in respect of any such powers as the Committee may sanction, together with their reasons and a statement of recent precedents applicable to the case. Among the proposals thus sanctioned by the Committee of 1882 were clauses providing for the notification, and prevention, or otherwise dealing with infectious disease. They, however, declined to entrust a corporation with power to close schools and exclude scholars during the prevalence of infectious disease. We must admit that, as the Committee observe, "the experience thus gained by Local Acts has served, and may serve again, to lay the foundation of useful public Acts of general application." These words are therefore intended to recommend not so much the suspension as a severe limitation of, and a rigid control over, a class of legislation, which, under due limitation and control, may prove useful, primarily to the communities which are the subjects of these experiments, and ultimately to the State.

There is, in my judgment, much reason to regret that the Legislature has not made general the principle embodied in many local Acts which enforce the notification of infectious disease. They govern more than thirty towns, and a population exceeding two millions and a quarter. Where these provisions are made they have worked for good, and, so far as I can learn, have for the most part become increasingly acceptable. The mode of proceeding, as to which wide differences of opinion doubtless prevail, and the arguments of the case, will be discussed during these debates. Suffice it to say, that to any one conversant with sanitary questions, it is heart-rending to find the objections made by those most interested, to the adoption of necessary precautions against the recurrence of terrible calamities, and their refusal to acknowledge the existence of "insanitary conditions which are well known to be extremely injurious to health, and to be universally condemned by all who have knowledge in such matters." An efficient Act for the notification of infectious disease would bring each case before the authorities. Moreover, if these be themselves intelligent and efficient, it would necessitate the adoption of such improvements as would remove from the dwelling causes recognised by all competent to judge as sufficient to produce a return of the disease which has decimated the household.

It would be a fatal error to believe that any branch of this great question can, even for a passing moment, be permitted to fall under neglect. But each year has a special problem; and the problem of this year is, to use a simple phrase, the housing of the poor. It would be impossible to record, within the limits of this paper, the group of measures dealing with the homes of the artizan class and their poorer neighbours, which have received the sanction of Parliament. Complete success has not yet attended our endeavours; but failures and disappointments lead to new investigations and more strenuous efforts. Too much may have been attempted at one time; and difficulties may have been raised which more prudent and tentative

measures would not have involved. Sir R. Cross's Act of 1875 would undoubtedly have been more effective had the original Bill not been burdened by the restrictions which the subsequent Act of 1883 removed.

The density of some populations exceeds what most men would think possible. Of Liverpool, for example, the accomplished medical officer reports in the present year that in his city "there are only 44 yards of space for each individual, and from this must be deducted a proportionate amount for docks, public buildings, manufactories, &c., and to these must be added thousands of animals devitalising and polluting the air, besides numerous offensive trades." So incredible is the density in some districts that Dr. Stopford Taylor continues, "there are dwellers in the old courts who have not more than 4 yards each, a density equal to 1210 per square acre." The average density of population of England and Wales is 1·43 acres for each person. Such circumstances are justification for some of the Local Acts affecting Liverpool, and it is a satisfaction to find that in many particulars, notably in purchasing, with a view to destruction at a reasonable cost, of insanitary dwellings, beneficial results of large and increasing proportion have followed this legislation.

The case of Liverpool has been mentioned because the dangers to health in this vast seaport have been of an exceptional character. Active measures have been taken in other towns with results which have been an ample reward for earnest and well directed labour. It is invidious to mention names. But as a close observer of events during upwards of thirty years I cannot withhold an expression of gratitude to the Corporation of Bradford, which has shown the vigour of Yorkshiremen in grappling with difficulties and compelling obedience to the laws. The health of this great town has by these means become such, that few of our great cities have so continuously reported so low a death rate.

The houses occupied by one family do not present such difficulties as houses let in separate lodgings, or "tene-

ment houses;" although the Act of 1875 and Local Acts enable the authorities, with the consent of the Local Government Board, to make bye-laws regulating such houses, the Acts may fail unless ample discretion in the application of these bye-laws be accorded to the local authorities. Without such elasticity many houses may be brought under provisions which are not only unnecessary in their cases but vexatious or even degrading. Moderation, judgment and patience must temper our zeal if the work of sanitary reform is to proceed with safety and success.

Public attention has been at length aroused, and is now fully directed to this most complicated question of the homes of the people. It is premature to make further observations until the issue of the Report by the Royal Commission. While statements beyond the truth may have given a sensational character to much writing, there will undoubtedly be found sufficient to justify the alarm and sympathy which skilful pens, and not less skilful pencils, have excited. But let it not be forgotten that the homes of the people depend upon the people themselves, and that neither cubic space, nor sound structure, nor sanitary arrangements, will attain their end if indolence suffers dirt to remain; if neglect fails to make due use of the best appliances; if reckless, almost savage, violence destroys that which is provided for the comfort, nay, even the safety of life.

The advance of science applied to the investigation of natural laws affecting health will increasingly connect known facts with preventible causes, and thus prove the necessity for renewed exertions in new fields. To milk, for example,—until of late regarded, by the unlearned, at any rate, as the most safe food—are now traced diseases of the most infectious and fatal character, the result in each case of careless or culpable mismanagement. Bread —perhaps the only food universally in use among all races of men—may be prepared with such negligence, or want of knowledge, that poison may lie hidden in the loaf.

Even education, unless due regard be paid to the conditions of youthful life, is proved to be a danger—a danger

so great that the consequences can no longer be ignored. Every true friend of education deeply regrets that the Education Department has so persistently concealed the report of Dr. Crichton-Browne, wherein that eminent physician places on record facts and arguments which ought not to be concealed from parents, from teachers, or those responsible for the safety of the young. Meanwhile, Dr. Crichton-Browne states that this report contains "strong evidence that over-pressure exists in elementary schools, that it is even now injuriously affecting the health of the children, and that it promises a rich harvest of degeneration hereafter." The school itself, finally, unless strict regulation be made, becomes a means for the communication of infectious disease.

The decision of June, 1884, which lays down the law that home lessons cannot be enforced, will do much—possibly too much—to prevent over-pressure in elementary schools. This decision is itself practically a new enactment. It would not have been obtained had not the public mind become sensitive as regards over-pressure. Thus, as has been long foreseen by thoughtful men, too great eagerness produces reaction, and a cure worse than the disease becomes itself a cause of new anxieties.

Parliament has neglected neither milk nor bread. A recent Act brings under inspection and regulation cow-houses and dairies. This statute, like many others, exercises a salutary influence beyond the technical provisions. The importance of the subject is understood, and more care is taken as to details not prescribed by the Act. In 1883 bake-houses were again placed under the Local Authority with enlarged powers. Lastly, the education code now confers on Sanitary Authorities the power of closing schools where infectious disease is prevalent in the district.

So many indeed and so unexpected are the sources of mischief that some injury to health may be shown to exist even in the model dwelling rising up to the heavens, with courts and passages which neither invigorating sun-

shine, nor health-giving breezes, nor purifying floods of rain driven before the fresh winds can search out and thoroughly cleanse.

The preceding passages have been written in vain if they have not proved that we have ready to hand on the Statute Book a wide-reaching and at the same time well elaborated scheme of legislation. In the main, as I have endeavoured to prove, thoughtful self-denying administration is the work of the coming years as regards the provinces. Areas must be enlarged where narrow, so far as local susceptibilities may admit, to the end that more comprehensive plans may be adopted, and at a less cost than schemes, too often imperfect in their first conception, defective in execution, and at best less adapted to the neighbourhood, taken as a whole, than one well-considered system. Salaries on a more liberal scale will tempt into the service officers more few in number, but more accomplished—a change whereby the service will be improved and the expenses reduced. The authorities, rising to a still higher view of their duties, will become yet more efficient, because they will bring a more cultivated intelligence to the fulfilment of their responsibilities.

Grateful indeed should the country be, both to officials and to members of public bodies, who bring fitting qualifications to their philanthropic work. Amid such labours friendly criticism may whisper a word of kindly counsel; but the sentiment which fills the mind of those who have sanitary progress at heart is admiration for excellent work honestly done, and forgetfulness of self in the service of the nation.

The CHAIRMAN said as there was to be no discussion on this introductory address, he would simply beg to tender Mr. Powell the best thanks of the meeting for his Paper. He was one of those who had acted up to his preaching, and had himself enforced lessons he had taught, for he had long done yeoman's service in the cause of sanitation. He then called on Mr. Collins to read the following Paper :—

WHAT CONDITIONS ARE ESSENTIAL FOR A HEALTHY DWELLING, WHETHER IN AN URBAN OR IN A RURAL LOCALITY; AND HOW FAR IS IT DESIRABLE THAT THEY SHOULD BE RENDERED COMPULSORY BY LEGISLATION?

By H. H. COLLINS, F.R.I.B.A., M.S.I., &c., &c.

THE question divides itself into *two* heads, the first of which alone opens out and embraces the whole field of hygienic science; yet, *great* as it is, it might be answered in one *small* word—cleanliness; for this is the essential of all sanitary works, and is its synonym. What does this mean? The conservation of God's common gifts to man, in the same condition as they were rendered to him—unsullied air, pure light, unpolluted water, uncontaminated soil, and sanitary surroundings. These conditions can, however, only be obtained by strict attention and adherence to nature's teachings. They are each and all interwoven and interdependent. Neglect of one inevitably produces injury to the other. They are Graces or Furies, as we make them; health or sickness, life or death, as we treat them.

The evils attendant upon unclean "ground-air" has been proved to demonstration by Pettenkoffer. This air, he proves to us, in its *ceaseless* motion, is ever absorbing itself into the underground water, penetrating into the substances forming the soil, sinking or rising by difference of temperature, or influenced by barometric pressure; sometimes causing putrefaction, and at other times acting antiseptically, always ready to intrude and commingle with the air of the house, bringing with it those microscopic and morbific germs, ever ready to germinate in suitable soil. From the

greatest depth of the soil to its highest level do these unwelcome visitors present themselves, though the senses are all unconscious of their presence, and know not of their existence, except by calamitous results.

Now, it is well known that the quality of air is ordinarily tested by the amount of carbonic acid gas which it contains. Pettenkoffer's investigations go to show that "ground-air" invariably contains 50 per cent. of this gas more than "ground water," so he adds, it is clear that it is the air which impregnates the water, and not, as is generally supposed, the reverse; and he draws the natural inference, that the source of this gas is to be found in the soil; that it parts with it simultaneously to both air and water, but with far greater facility to the air than to the water. I have dwelt rather long on this subject, because a *healthy foundation* is the fundamental essential of a *healthy* dwelling.

What are the lessons to be derived from these facts? That, irrespective of all statical or constructive considerations, we must, before all things, drain the subsoil of our houses and their surroundings, and confine all impure emanations by sealing the sites with impervious coverings of concrete or asphalte—that the formation of our roads, and the surroundings of our dwellings must be similarly treated—that no soil must be considered as "virgin," but all must be carefully examined, and every precaution taken to ensure this first essential, a *healthy* foundation upon which to erect a *healthy* house. Poison the soil, and you poison the atmosphere.

Our next care must be not to foul the air by *bad drainage.* All connections between the main sewer and the house must be studiously avoided, since gases pass, sooner or later, with the greatest ease through all water-traps, and evaporate into the air of the house, and so pollute it; we must periodically examine and cleanse our drainage system, and so lay the pipes as to admit of this being done with ease and economy. Command as we may the impure air to go "so far and no further," we cannot ensure obedience; and therefore we must so dilute and oxygenate by ample

ventilation our drainage system, as to deprive the air, if tainted, of any noxious tendencies. Remembering that the air, like water, travels and flows, we must by the interposition of areas, or by cementing or asphalting the walls where the earth abuts against them, shut out and prevent all air currents flowing to the interior of our houses.

The aspect and location of rooms must be sanitarily adapted each to their several uses, so that every apartment may freely partake of surrounding pure air, and each have its due proportion of sunlight (when this can be obtained); for it must not be forgotten that in this climate it has been calculated that we only obtain 189 days of sunlight, and that last year according to the Astronomer Royal we only enjoyed 51 days 17 hours.

To ensure *pure light*, important as, and coincident with, *pure air*, care must be taken that our houses are built with sufficient space surrounding them, to such a height that they will not overshadow each other, and so planned that a certain number shall only be permitted to be erected per acre.

Rest assured that a dark house must engender an insanitary condition, irrespective of its depressing and lowering tendencies.

A house bathed in air possesses in itself an antidote to many of the evils I have sketched. But given a well selected and protected site, with good drainage, clear sunlight, and well-planned accommodation, one precaution must be insisted on, if we would maintain the sanitary state of things we have taken so much trouble and expended so much thought to obtain: We must not "overcrowd." The cubical contents of the rooms must be proportioned to their inmates. Overcrowd the most sanitarily arranged domicile, and ultimately it becomes totally unfit for habitation. Not only do we destroy the purity of its atmosphere, but we generate deleterious organisms, which live and thrive in the *very* interstices of the materials of which the house is composed, and once created and vivified, it is seldom that we are able to destroy them. Never should the axiom

formulated by that eminent sanitarian, Dr. Farr, be forgotten, that just in proportion to density, or proximity of population, is its mortality.

Water—the next essential—the absolute necessity of life—the medium of all others most easily fouled—the most fertile cause of insanitary conditions—how shall we preserve it pure and undefiled? By strict attention to the state of the air. We have only to peruse that most charming volume, 'The Floating Matter in the Air,' from the pen of Tyndall, to convince ourselves of the necessity of adopting the greatest precaution in this respect. I venture to assert that beyond a doubt a single virus of disease may impregnate a source of water and give life to myriads of bacteria and other low forms of organisms, perhaps the origin, certainly the producer of disease. Do we want confirmation, we have only to make ourselves acquainted with the admirable researches, and their benificent results of Lister, Koch, and Pasteur, as evidenced by the stamping out of the anthrax of the cattle, the pébrine of the silkworm, the chicken cholera of the fowl.

Yet let us bear in mind that Tyndall proves to us that these beginnings of life "are only noxious when out of their proper place." Our plumbing, therefore, should be most carefully contrived, with pipes of good and perfect manufacture, tested to a strength sufficient to withstand any outside influences; joints carefully made; wastes and overflows disconnected from drainage; improper types of w.c. apparatuses discarded, with traps cautiously applied, and when used of proper construction; with soil-pipes open at top and bottom, and freely ventilated, positioned away from all ingress to the house; with rain water pipes similarly treated. Baths, lavatories and sinks, not only of best character, but likewise sanitarily located. With cisterns so positioned as to be facile of access, and of such material as to admit of easy cleansing; with drinking water so jealously guarded that by no possibility can it have any connection with that used for ordinary cleansing or ablution purposes. With filtration so contrived that the

filtering medium can be periodically and readily renewed. With ample supply (supply enough to waste if you will) profusely used for flushing and cleansing purposes, and when once soiled instantaneously removed from the house and its precincts.

Lastly, it should be a canon of water supply that nought but pure and undefiled water should ever be allowed to remain within the healthy house, and this points to the necessity of a constant supply.

All the sanitary provisions which I have thus hastily generalised will be rendered comparatively nugatory if the *surroundings* of the house be contaminated, for doors, windows, ventilation, and even walls, whether of brick or stone, will admit immundicity.

One of the greatest offenders is the dust-bin; it is, and has been, more productive of disease than it is credited with. No vegetable or organic matter should ever soil its interior, such should be invariably burnt; it should be manufactured of light galvanised iron, constructed with a lid so as to prevent the insertion of improper materials and to obviate the scattering of its contents.

A new dust-bin per annum would not be an extravagance. The purview of the healthy house should be as clean as its interior; festering excrementitious matter should be carefully removed or destroyed. Generally, walls should be of ample thickness, built of good new materials, should be furnished at base with damp-proof courses to prevent by capillary attraction the rise of moisture, and protected at top with good parapet walls or projecting eaves to stop the soakage of water into the body of the work. It would be well if floors were constructed of fire-proof materials, not only for health sake but to prevent propagation of sound, which to nervous temperaments is, if not unhealthy, extremely distressing. Time forbids me to add to the list of essentials of a well-planned and *à fortiori* a healthy house. I have confined my remarks to the essential sanitary requisites, but I have not forgotten the active part which coal-fire and smoke takes in the question

of fouling the air and destroying the purity of surroundings, nor products of gas combustion and other modes of lighting and the necessity of their speedy dispersion, nor the vexed question of ventilation and many other subjects, which, if not absolutely essential, are at least necessary to constitute the amenities of a healthy dwelling; but, obviously, to enumerate or to dwell on them all would enlarge this to an essay instead of a paper of twenty minutes' duration.

In the grounds of the Exhibition will presently be exhibited, side by side, sections of a Sanitary and of an Insanitary House. The Sub-Committee who have planned the same (of which I have had the honour and pleasure of being a member) have sought therein to show *some* and *some* only of the conditions which constitute a healthy and unhealthy house. They have laboured, however, under the same difficulty which I have experienced in preparing this paper, viz. the dealing with a very large subject with inadequate time, means, and space at their disposal; and when you shall criticise the confessedly imperfect details of their labour, I ask you to judge of them with kindly consideration, bearing in mind that is presented a mere educational sketch, although it is an honest endeavour to bring home to the minds of the uninstructed multitude the evils which exist and the ease and economy with which they can be avoided and rectified.

There is one subject which, however, I should wish to bring before this Conference—viz., the enormous height to which houses are now being erected, caused by the extreme value of land, or other economical exigencies; but, nevertheless, effecting insanitary conditions of a grave character, shutting out light and air, and sinking the occupants of the lower stories into wells of stagnant atmosphere. Let me direct your attention to a model of an Artizan's Building (shown in this Exhibition) of this description, about to be erected in the Minories by the Metropolitan Railway Company, about nine stories high, with enclosed areas or inner courts, about thirty feet wide, and surrounded by other properties. Should such a work as this be permitted?

We have the testimony of Dr. Beddoe "that lofty staircases tell unfavourably on the health of those frequently ascending them, producing anæmia and functional affections of the heart"—and who can doubt it? Surely, buildings of this class are not the outcome of philanthropy, but of crass sanitary ignorance.

Sensible that I have omitted much which should have been stated in this paper, had time permitted, I beg to submit that all the essentials which I have enumerated are as necessary for the sanitary well-being of a *Rural* as of an *Urban* dwelling, and that all the precautionary measures suggested are as capable of being applied to the one as to the other—of course under different conditions—for example, probably irrigation would take the place of drainage proper, earth or pail closets of water closets, and so forth. Without adopting many of the views suggested by the author, I would strongly commend to the notice of the Members of the Conference the very valuable, instructive, and admirably written handbook, by Dr. G. Poore, entitled: 'Our Duty in Relation to Health,' wherein will be found much cognate with the subject of to-day's discussion.

In the Sanitary and Public Health Acts of the United Kingdom will be found ample provisions for ensuring the hygienic precautions necessary to the perfection of healthy habitations—model bye-laws, rich with sanitary instructions of every conceivable kind, and applicable to almost every circumstance, have been largely published and freely disseminated,—whilst the literature on the subject is enormous.

The public health of the country bears testimony that neither the law nor the instructions have been in vain. I am, therefore, strongly of opinion that we have legislative enactment more than enough; the rock to avoid is rather over-legislation. The difficulty is to obtain an energetic administration of the law as it exists. No doubt there is room for amendment, and that from time to time improvements will have to be effected, but fundamental principles are now well recognised. We all admit that the science of

legislation is still but in its cradle, and although the infant is thriving, and bids fair to arrive at useful and vigorous virility, we must still humbly bend to the conviction that, with Newton, "we are merely children picking up pebbles on the sea-shore of hygienic knowledge as we go."

Amongst those amendments which I venture to think essentially necessary are, *uniformity* both in action and area; abolition of distinctions between *urban* and *rural* districts; the application of the Sanitary Acts to the whole kingdom; the recession of exemptions; and independent and clearly-defined status for our medical officers of health, with adequate remuneration; properly educated and certified inspectors; and, above all, a moving, controlling, and initiative power embodied in a minister of health, endowed with responsible authority, and assisted by the best scientific, medical, architectural, and engineering ability; such an authority as this would lend dignity to the office, and would stimulate the local authorities throughout the length and breadth of the land. This has been advocated and urged by our Association for many years; it would be more efficacious than drastic remedies and sanitary policedom.

It may be naturally asked, "if we have all this legislation and the means of carrying it into effect, how is it that there should exist even partial failure?" One little word would answer the question—Ignorance! If once local authorities could grasp the tangible money value attached to good sanitation; if they could realise the significance of the removal of only a decimal point in the tables of mortality; if they could perceive the reduction of pauperism, the elimination of disease, drunkenness, and crime, the diminution of police, the saving in gaols, workhouses and lunatic asylums which would follow, there would be no difficulty in their eagerly carrying out the law; but, like the Education Act, it must take some years before these truths can be realised, and, by-and-by—and it is rapidly approaching—there will be no more need of armies of inspectors to compel parents to send, and children to

go, to school, than there will be to enforce sanitary regulations.

Quoting the words of an impressive writer, he says:—"On public sympathy the sanitary physician has mainly to rely for support, the cause of calamity being more clearly revealed not only to the physician but to the public, whose intelligent co-operation is absolutely essential to success, the final victory of humanity is only a question of time."

A few years ago it would have been impossible to have projected a Health Exhibition such as the present with any chance of success, and this shows that the time has approached when the public are arousing from their lengthened torpor, and are awakening to an interest in those subjects which conduce so much to their happiness and well-being.

I am convinced that whilst the elective element is such as it is, some pressure must be exercised. The natural desire of all local authority is to reduce local burdens, and it is only by practical experience of facts that it can realise the benefits which sanitation creates. But apathy, whether of public or of local bodies, cannot in the interests of the community be permitted to exist—"Evil is wrought from want of thought, as well as want of heart." The community must be impressed with the truth that health and wealth go arm-in-arm, and that there is a material tangible economy in an apparently lavish sanitary expenditure.

There are three moods through which local authorities generally pass, but they are not in grammatical succession; the first, unfortunately, is the *potential*, the second the *infinitive*, but the third is the one which I am in favour of, the *imperative*, and this, therefore, is the answer which I render to the last portion of the question—Legislation to be effective should be *compulsory*.

DISCUSSION.

Mr. FRANCIS POWELL said Mr. Collins had somewhat enlarged upon a point which he himself had incidentally referred to in his paper, namely, the increasing tendency to construct lofty houses, and he believed this would become in the course of the next four or five years, if persisted in, a matter of very considerable importance. Mr. Collins spoke of wells of impure air to be found at the foot of these dwellings, and such must be the condition of things with such lofty buildings. He looked with grave apprehension at some of the model lodging-houses which had been lately built in London, and he believed there were courts connected with some of these buildings which could not be reached by sweeping currents of air, which sweeping rains could never thoroughly cleanse, and the life-giving, vitalizing sunshine could never touch. This was a very serious condition of affairs, and as so much was being done in London now in the construction of model dwellings, and also in the construction of commercial buildings of unprecedented altitude, he hoped public opinion would be aroused before it was too late. These buildings were costly in construction, they were designed with great skill as regards the convenience of those who dwelt or laboured therein, but if there were at the root of the matter a violation of sanitary laws, no skill and strength of construction and no convenience of arrangements could possibly atone for that fatal defect. He hoped that this matter would be attended to before the mischief became so wide that to remedy it would be very costly and expensive.

Mr. BOURNE (Steward to the Duke of Bedford) said the subject of the housing of the people of London and getting rid of unsanitary dwellings was a subject in which many people were now interested, and if those who had an interest in this subject and a knowledge of the evils to be dealt with could be brought face to face, it would probably

be the best way of devising some remedy. He quite concurred with the remarks made about lofty houses, and he must say this matter had filled him with great concern; he had watched the erection of several in different parts of London, and had seen with some alarm a disposition to raise these lofty buildings without having a sufficient area left around them. The great thing was to keep down the height, so that sunshine might reach each side at some portion of the day. There were but few hours of the day when the sun shone in London, and if buildings were put so high that it was impossible that the sun could, even in the summer time, get at one side at least of each building, it was certain in the long run to lead to discomfort and depression on the part of the inhabitants, and instead of proving to be a benefit to the working classes they would only prove to be a curse. Of course they all knew the reason which had led to the adoption of these high buildings. It was said that you could not extend London on the surface, and that, therefore, you must extend it upwards towards the sky. Another reason alleged was that the working classes must be housed on the spot where they had been accustomed to live and work. It was a matter which admitted of considerable doubt, whether it was necessary to re-house the working classes on the same spots they had been in the habit of occupying; at all events, it was not so necessary as to lead to overcrowding of the neighbourhoods again with a class of buildings which were perhaps destined to be ultimately of an unsanitary character. Although constructed of the best materials, although erected under the best guidance of skilled architects, and under the supervision and judgment of surveyors, yet if they turned out to be so many traps, it would be of very poor service indeed to the occupants. Why should these people live on the same spot? He thought it would be doing a great service if they sought to break up those nests of one class of people, and to scatter them about rather than let them live together. Was it not possible that very many of the works now carried on in the heart of London, might with greater

efficacy be carried on in the country, or, at all events, in the suburbs. It was not difficult for men who knew the different trades to be able to point out very many classes of trade which could be just as effectively carried on in the suburbs, or even further away. An illustration occurred to his mind of a wholesale bookbinder, who employed a number of men and women, and who told him that he must have larger premises as his trade was increasing. He put the question to him, why he should not carry his building out to the suburbs, and he replied that his people would not go there, that he could not get the girls and women to work there. He asked him if he had ever tried it, and if he did not think that if he put his works there, and insured the people regular employment, they would very soon follow him. He said he had never thought of it in that light, but he had no doubt they would. It would be the same with many trades which might reasonably be carried away from the heart of London, and if this were done more, it would go a great way towards breaking up these hordes or class localities which gave so much anxiety and caused so much complaint. There was another point on which he heartily agreed with both papers, namely, that it was the ignorance of the people themselves which formed a great source of the discomfort they suffered from. It was ignorance of that kind which could only be met, while they were training the people and getting them to see the benefits of attending to sanitary laws, by compulsion: until they could persuade them to act according to law they must be compelled. Although it seemed a harsh thing to say, he was quite certain there was nothing which would tend to make the courts and streets and the closer localities in any degree decent except the presence of the policeman. There must be a healthy public opinion set in which would uphold the hand of the magistrate in enforcing the law as it now existed. There was plenty of law if it were only strictly and rigidly enforced; and he was quite certain that until they had the policeman in every house where it was necessary to take

him, they would not secure proper observances of the sanitary rules and regulations indicated by the Legislature.

Mr. DEBORAM (Plymouth) said he had been forcibly struck with the remarks made as to the height of buildings, and a remark just made reminded him of the saying that he heard that the world was large enough for all, especially upwards. On the other hand, if houses were built like some he had seen yesterday on the marshes, another evil would be engendered nearly as bad as that arising from high houses. The mischief he referred to arose from the unhealthy nature of the soil, for there you can see the damp rising on a cold morning right through the floors of the houses that the poor people lived in. To go from these very large houses and build on these marshes, was only going from one evil to another. He must say he did not think the Exhibition tended to educate the people so much as he thought it would do. He came from the country with the idea of learning something. He was struck with the appearance of the show cases and baskets of tinned meats, and so on, but only that day had he been able to find what he called the practical portion of the Exhibition. It appeared to him that the diagram showing the sanitary and unsanitary buildings being put in one of those quarters where only drain pipes and such things were to be seen, with the idea of educating the people, was a very great mistake. That which the people wanted to know most of was put up in corners and out-of-the-way places, where it was not noticed. He had also been astonished to see drawings of what was supposed to be a healthy house, showing the ventilation pipe, with no less than seven bends in it; and he did not know where the committee could have been to allow such a thing to be shown in a Health Exhibition. Then with regard to the water supply, he did not believe there would be a proper water supply until there was a Government administration of all the water supplies of the country. He lived in a district where there were three towns separated by a gutter, having three distinct water supplies. At the present time extreme drought existed

in one district, whereas, if they were all under one administration—and they all got their supply from Dartmoor—the whole of the people would have a good supply at one half the present cost.

Mr. STANLEY BIRD (President of the Builders' Association), referring to the latter part of the question, the necessity for compulsion, he said a fact which had recently come under his notice in the centre of London showed how important this was. He had lately been getting out some foundations very near the centre of London, and in so doing had come across a stratum of earth about one foot below the present street, on which had evidently been built some houses and small tenements. Underneath those houses, at a depth of four feet, there were some cesspools which must have been laid there at least 100 years, and how long before that he could not say; and how the people existed on such a hot-bed of disease he could hardly imagine. Again, eight feet below that, they had come across another road where other houses had been built, and under those again were another series of cesspools, and, therefore, for some two centuries or more houses had been built, one upon the site of the other with these cesspools underneath. Again under this road, they had come upon some wood water-pipes, evidently laid by the New River Company, about the year 1600; they were no doubt conduits for carrying water to the inhabitants of the neighbourhood. When they were opened they were found to contain the most poisonous water. How long it had been there they could not say, but he should think anyone who drank that water must have been drinking almost certain death. In those old days there was no compulsory power, and even now there was not very much, but this certainly proved the need for it. Mr. Collins, towards the close of his paper, remarked "that the community must be impressed with the truth that health and wealth went arm-in-arm, and that there was economy in apparently lavish expenditure." Now, as a builder, he might be supposed to be in favour of money being spent lavishly; but having been through the Exhibi-

tion, he must raise a voice of warning against some of those gentlemen, who called themselves experts, and their devices. The case of a ventilating pipe, with seven or eight bends in it, had just been referred to, and anyone with common sense must know that that was altogether absurd. The danger was, that if they did not mind, these experts would be riding their hobbies to such an extent that people would be frightened, and that instead of its being a pleasure to see a sanitary engineer come into a house, they would be looked upon with the same loathing as a quack doctor. The aim of some of these sanitary engineers seemed to be to invent some wonderful traps or apparatus, which would immortalise their names, and hand them down to posterity; but the great aim in all these matters should be simplicity.

Mr. ARNOLD, as a member of a country sanitary board, said he must take exception to a few words Mr. Collins had said with regard to the power of sanitary boards to take care that houses were in a sanitary condition. The fact was that they had no such power, and he could give an instance which was now about to occur in a district where he lived. Some very large carriage works were about to be erected, and some hundreds of acres would be probably covered by labourers' cottages. The whole of these would be built by speculative builders, and as far as he could understand there was not a single provision for sanitary arrangements. There was a good water supply fortunately, and plenty of fresh air, but there were no arrangements for drainage whatever, and the local board had no power whatever, as far as he could see, to alter it. They had constantly brought before them cases in which buildings were put up which were perfectly worthless, but they could not prevent it. They could make them provide water and one or two other things, but the essential matter, such as the foundation and the manner in which the houses were built, they had no control over.

Mr. E. T. CRAIG differed from one or two previous speakers in some respects; for instance, he considered they

wanted legislation to establish a Minister of Health. He was also opposed to the combined system of sewerage which had been carried out so largely in connection with water supplies. The most important question in connection with Mr. Collins's paper was how to deal with the question of existing conditions. He admitted the necessity of having new houses properly built and arranged, but how were the four millions of people in London to obtain those conditions? When Mr. Bourne took up the idea of sending the manufactories into the country, to a certain extent he showed the possibility of moderating those conditions. Those circumstances had given him a special interest in this question, for more than fifty years ago he was invited to go to Ireland to manage a turbulent population which was in outrageous rebellion; there were four murders in the first six weeks he was there. The previous steward had been shot, and his own grave was dug in the night, but yet he got those people to combine together to conduct the estate, and arranged that they should live near the farmstead. They built their own cottages, and he made it a rule that no children who went to infant schools should sleep with their parents, but should live in special dormitories. But though in 1833 scores were dying in the neighbourhood from fever and cholera, they had not a single case, and that produced a powerful effect on his mind. All the boys were employed part of the day and educated the other part, and that experience led to his organizing the first industrial school at Ealing. Going into the manufacturing districts he saw the terrible destruction of health and wealth by insanitary conditions with regard to the ventilation, and turned his attention to it. This led him to make a series of experiments extending over twenty-five years, and he found ultimately that there was a natural law by which any room in any building could be ventilated. He wrote about it, but no one adopted his suggestions until, from his conviction of its vast importance, he gave up his position as editor of the *Oxford University Herald* and became a ventilating engineer, and followed out the matter practically

in Manchester, Glasgow and other places. He had given this up now for some years, but he had with him a model of a ventilator by means of which every room in a building might have continuous ventilation without draughts.

The following paper was then read by Dr. Bridges:

WHAT, IF ANY, RESTRICTIONS IN THE INTERESTS OF HEALTH SHOULD BE ENFORCED IN CONNECTION WITH THE EMPLOYMENT OF GIRLS AND WOMEN IN WORKSHOPS AND FACTORIES?

By J. H. BRIDGES, M.B., Inspector under the Local Government Board.

IF a substance of any kind, say a large block of stone, be pulled or pushed at the same time in two different directions, by two equal forces that we can accurately measure, one of them driving to the north and another to the east, we know exactly the course that stone will take, and where to find it at any given moment. It will travel to the north-east, to a distance which depends on the weight of the stone, on the amount of each of the two forces, and on the time for which they have been acting. The path actually taken by the stone we call the resultant. Its direction we can foretell with perfect precision; and, apart from friction, we can tell also the distance it will travel. But a leaf driven by the west wind in autumn, or a branch carried down the eddies of a torrent, who shall foretell their course? We know the forces at work, we know therefore something of the probable direction of their resultant; but the tossing from tide to tide, the whirling of the eddies, the

violence of the back-currents, offer problems far too great for accurate measurement.

Thus it is with almost every problem of practical life. The line of action to be taken depends on a multitude of principles working in different directions. It is easy to come to a decision if we fix our minds on any one principle, as, for instance, on the advantages of the State doing everything for us, as Carl Marx and the Socialists would have it; or again, on the disadvantages of the State doing anything for us, as Mr. Herbert Spencer would have it; and if we follow this or that solitary principle to the exclusion of all others, we shall assuredly not find the true resultant in that way; even supposing that we shall be able to find it at all. What we have to do, as students of social facts, is to disentangle the various principles at work, and allow to each one of them, so far as our share of wisdom may enable us, its proper weight.

Let us recall some of the conflicting tendencies that have to be considered in all legislation that aims at controlling labour:

1. Trade competition drives employers to diminish the cost of production in every way, therefore to diminish their weekly bill for labour.

2. The substitution of steam power, or other mechanical forces, for muscular effort, makes it possible to utilize a quantity of cheap labour — the labour of women and children—which would otherwise have been unavailable.

3. The machine being very costly, it is profitable to work it continuously; if not for the whole twenty-four hours, yet for the longest time that may be possible.

4. Though the wages paid to each worker may be small, yet the aggregate receipts of a large family may be large. Where the head of the family is self-indulgent and brutal, he co-operates with the employer in allowing his wife and children to work long hours, because he is thus enabled to live in idleness himself.

5. To all this there were counteracting tendencies. While in times of slack trade the master strove to keep the price

of labour down, yet in times of brisk trade he competed with his fellow employers for a larger supply of labour, and this tended of course to drive up its price, often very suddenly, thirty or forty years ago. Hence followed an enormous influx of labour from very remote villages into the northern towns. Poor people from the midland counties, or even from Suffolk and Wiltshire, with large families, found themselves receiving at the week's end four times as much as they had ever earned before. Much wasteful expenditure resulted ; improvident marriages were encouraged ; the crowded conditions of town life, while supplying better food—or at least food that was more abundant and stimulating—lowered the standard of cleanliness, sobriety, and chastity. The competition of the employers for labour, though tending to raise wages, did not therefore bring about a satisfactory solution of difficulties.

6. The ordinary check against a low rate of wages, or undue prolongation of working-hours, is the combination of labourers to raise wages and shorten hours of labour.

But independently of the fact that during the early years of the Factory system very stringent laws against Trade Combinations were in full force, a far more formidable obstacle to united action was the fact that the members of a Union of factory operatives must consist, in great part, not of heads of households fighting each in defence of his own family, but of the women and the children of those families themselves. Now there never has been a good fighting army made up of women and children yet; and I do not suppose there ever will be. In the great factory strikes, as in that of Preston thirty years ago, or the celebrated Plug riot of an earlier date, there has been ardour and enthusiasm enough. But the stringent discipline, the steady, firm, united front, the stolid, stubborn resistance necessary to convert a strike, which is a mere angry battle, into the quiet organization of defensive effort known as a Union, has been hitherto wanting ; excepting indeed in those departments of factory labour where the working majority were adult men.

7. Trade combination failing, there was no other resource than legislation. The struggle for it was a very long and fierce one; but once obtained, a singular unanimity has obtained amongst all classes as to its value. The employers recognised its value as protecting the humane majority amongst them from the downward competition of the reckless and grasping few. There was an end to the scandal of infants of six years old forced to stand at a spinning-frame till they became cripples. Women were allowed a pittance of time to attend to their households; men were protected to some extent, at any rate, so far as the hours of labour were concerned, against the downward competition of women. In short all classes were reasonably satisfied, and neither the cotton nor the woollen trade were ruined by it, but quite the contrary. In Russia, we have Mr. Mundella's high authority for stating, less work is turned off by 134 hours of weekly labour than in England by 56, and this though the machine in both cases is precisely similar.

The success of legislation for textile factories led inevitably to the extension of official control to factories of other kinds; that is to say, to manufacturing works where mechanical power was used, and where considerable numbers of workpeople were employed. This extension took place by the Acts of 1864 and 1867, and the line was drawn at works employing any number of hands above fifty.

It is obvious that this line was extremely arbitrary. There was no reason why a child in a small factory required protection less than a child in a large one. And the inevitable result followed, that the large employers, feeling themselves handicapped by restrictions as to hours of labour, which did not apply to their humbler competitors, supported the philanthropic reformer in extending legislation still further to workshops of every kind, large or small, worked by mechanical power or not. Hence the Workshops Act of 1867. The restrictions imposed by it were placed under the control of the municipal authorities

in the first instance. But for various reasons, one of them being that workshops were exceedingly numerous in many districts where there were no municipal authorities, they were placed, in 1871, like factories, under the superintendence of the Inspectors of Factories. Four years afterwards, when these gentlemen appeared before the Commission of 1875, but few of them were able to say that they had been able during that interval to visit each workshop once, and many had not been able to inspect one-third of them.

The result of the Commission of 1875, was the Consolidated Factory Act of 1878, amalgamating the chaos of regulations that had resulted from the legislation of the previous forty-five years, into a comparatively simple series of regulations.

This act takes cognizance of five classes of works:

1. Textile factories; including those in which cotton, wool, silk, flax, and jute were operated on by steam power.

2. Non-textile factories, as manufactures of earthenware, copper, iron, glass, paper, tobacco, bleaching works, print works, and all works whatever in which mechanical power is used, whether more or less than fifty persons be employed.

3. Workshops. These are defined to be: "any premises not being a factory, in which anything is manufactured for gain, and to which the employer has right of access."

Now workshops are of four kinds.

1. Those in which no women, no persons of either sex under age of eighteen, and no children are employed.

These were left entirely uncontrolled, with one curious exception, that of bakehouses, which were left subject to the sanitary inspection of the Factory Inspectors.

2. Workshops in which children, lads and girls under 18, and women are employed. These are liable to nearly the same regulations as factories, except that certain regulations as to medical certificates and as to registers are not insisted on.

3. Workshops in which none but adult women are employed.

Here the number of working hours is limited, as in factories, to 10½ hours on five days, and 7½ hours on Saturdays; but those hours may be taken at any time between 6 a.m. and 9 p.m. on five days; and 6 a.m. and 4 p.m. on Saturdays.

4. The fourth and last class of workshops consists of those in which the work is carried on at home, the only persons employed being members of the same family dwelling there.

In this class women are subjected to no regulations whatever. Young persons, *i.e.*, girls and boys between 14 and 18 are subject to the regulations applicable to adult women in class 3; *i.e.*, they may work from 6 a.m. till 9 p.m., with 4½ hours interval.

Children are subject to nearly the same regulations as in factories.

Certain kinds of domestic labour are wholly excluded from the operations of the act, viz.:

Straw plaiting.

Pillow lace making.

Glove making.

Now of course it is easy, so easy as hardly to be worth while, to pick holes in this legislative code regarded as a logical system. It is hard to deny that in so far as workshops are less restricted than factories, in so far as home industries are less restricted than industries carried on in a master's shop; to this extent are the more highly regulated industries placed at a disadvantage. The same restrictions should, it is said, be imposed on all; and this as a matter of abstract justice is undoubtedly true. The English spirit of practical compromise has interfered with logical precision: but not, perhaps it will be thought, unwisely or unduly. It has not been considered to be enough to prove that a grievance or an abuse might exist. The further question has been asked: Is that grievance one with which the law can efficiently deal, without introducing hardship and oppression of other kinds?

And now we have to face the question: Can this legislation be carried still further?

The most important extensions of factory legislation that have been proposed are, I believe, these:

1. Restriction to be imposed on the employment of mothers; namely, that it should be illegal to employ them for a period of six weeks after child-birth.

2. Extension of the Workshops Act to domestic occupations.

3. Extensions to various wandering occupations: as, *e.g.*, to chimney-sweepers [already under special, but possibly insufficient control], errand-boys, street-performers, and musicians, news-boys, match-sellers, &c.

4. Restriction of hours of labour in retail shops.

It is quite evident that a very strong case may be made for each of these proposals. We have to see whether or no there is a still stronger case against them.

The arguments in favour of the first are so obvious as hardly to need stating. The mortality of young infants in factory towns is large. It was admitted to my colleague, Mr. Holmes, and myself, when we were investigating the conditions of factory labour ten years ago, that women in Lancashire frequently returned to work within a few days of their confinement. When we remember that work with these women means incessant watching of four looms, through each of which the shuttle passes three times a second, for ten hours a day, and that during those ten hours she can never once sit down, every one can imagine, though no one but a medical man can fully appreciate, the enormous, the atrocious imprudence of such an act as this. In view of the miserable consequences, not here to be detailed, but which every doctor in factory towns knows to be involved in it; for the sake of the young infant, for the sake of the future offspring, should women be protected in this matter from the pressure put upon them sometimes by a brutal and drunken husband, sometimes by a stupid and greedy overlooker? Should their freedom of returning to

work be curtailed by law? Should it be an offence knowingly to employ any woman within six weeks of child-birth? This prohibition has been enacted in Austria, and I believe in Switzerland.

The arguments on the other side which have weighed most heavily are, that in the case of unmarried mothers this course might encourage concealment of birth. There is also the practical difficulty as to enforcing the law; and finally, there is the objection that it might discourage the employment of married women altogether.

But this last objection, though often pressed by those reformers who wish to minimise the distinction in the social functions of women and men, is, of course, to those who like myself are rather in favour of maximising those distinctions than of minimising them, rather an argument in favour of the restriction than against it. Theory apart, however, my very strong conviction is, that if the adult female population of Lancashire were asked at this moment to vote for or against the restriction which I am discussing, and to vote by ballot if need be, lest it should be said they were intimidated, an overwhelming majority would be recorded in its favour.

As to the practical enforcement of the Act, where public opinion enforces a law, the law and the opinion react upon and enforce one another. The mere existence of this law in such a case to a great extent ensures its enforcement.

As to the grave objection that it would encourage, in certain cases, birth-concealment, I would say that the motives for this criminal act are already, in the case of unmarried mothers, very strong, and yet that the penalties are also strong enough, in the great majority of cases, to resist the motive. I doubt whether one motive the more would operate appreciably to increase the number of instances in which the law is defied. On the whole, then, I consider that a case is made out for legal prohibition.

2. Extension of the Workshops Act so far as domestic industries are concerned.

It will be remembered that where a woman works in an

ordinary workshop her hours of work are restricted to the hours between six a.m. and nine p.m., with 4½ hours of interval. But where the work is done at home by members of one and the same family, there the woman is relieved from all restriction. The children, the girls, and the boys remain under control; but the grown woman may work as long as she likes. Now here is an anomaly. And just as twenty years ago the larger manufacturers complained that they were placed at a disadvantage by subjection to restrictions which did not apply to masters who employed less than fifty workpeople, just so are the women employed in workshops complaining of the rivalry of their married sisters who work at home, who are unrestricted as to hours of labour, whom it is impossible to organize into any kind of Union, and who are willing to accept any miserable pittance that the middleman is disposed to allow them.

But what is to be the remedy? To extend the provisions of the Workshops Act to domestic workshops? But this means, if it means any thing at all, that we are to follow boy, girl, woman and child through every moment of their working life, from their getting up in the morning till their lying down at night. This, I imagine, we shall not be able to do till we find a Secretary of State who is prepared to appoint one-half the population as inspectors of the other half.

The fact is that the inspectorial machinery has been strained already almost to breaking point by its application to workshops of the ordinary kind. The workshops of England number between 100,000 and 150,000. It is true they are small as compared with factories, and that the time needed for inspecting each of them on any one occasion is very short. But, on the other hand, the operations of the workshop, owing to its being small and secluded, are far more easily concealed than those of the factory. In a dressmaker's shop, for instance, a minute suffices to withdraw the workers, on the inspector's approach, from the workshop into the parlour. And I cannot but think that to maintain a really efficient control

over 120,000 workshops would imply such frequency of visitation, and such consequent increase of the inspectorial staff, as no Treasury would tolerate. The gigantic responsibility of controlling them would perhaps not have been undertaken at all but for the pressure brought to bear by the larger employers of labour, who found themselves unduly weighted by restrictions on factories which did not apply to their humbler competitors. I suspect that the machinery of inspection has been applied almost as far, and at almost as high pressure, as it is safe to apply it, without undue interference with individual freedom and domestic privacy; and, exceptional cases apart, I should be inclined to shrink from any considerable extension of it. The remedies for the undoubted evils that exist must be sought for in other directions.

3. Similar though slightly different considerations apply to the question of legal restrictions of labour in retail shops. That women, and men, too, are largely employed in shops at hours far later than are sanctioned by the Workshops Act is, of course, notorious. But it is urged, and I think with undeniable force, that to apply the Workshops Act to shops would result, in the very important instance of drapers' shops, in the substitution of men's labour for women's. And whatever view any one of us may take as to the assimilation of men and women's work, I believe there are none who would regard such a result as other than a grievous calamity and injustice.

It would seem that, in such a question as that of early closing of shops, more is to be done by kindling and organising public opinion on the subject than in any other way. As every one of us goes into shops and buys, the matter is forced upon the attention of each one of us far more vividly than in the case of any other industrial grievance. And when public opinion has been roused, it would seem to me, that the crystallisation of that opinion in legal enactment should devolve not upon the central Government, but upon the local authority of each township. In short, let us leave it to the inhabitants of each district to

decide, by their own municipal authority, whether their shops shall be closed early or late.

It will be seen, then, that on the whole, and with certain exceptions, I am for leaving the Factory and Workshops Act of 1878 alone for the present. I would take the first opportunity of legally forbidding the employment of women in factories immediately after child-birth; and I should also be in favour of one other change of considerable importance. I should obliterate the distinction which at present exists between factories and workshops as to their sanitary inspection. At present, while workshops are inspected by the medical officer of the Health Authority, the sanitary inspection of factories is left to a body of men who have rendered most invaluable services to the State, but of whom, it is not, I hope, any mark of deficient respect to say that their previous training has not usually prepared them to deal with the difficult and complicated questions of hygienic science. That science is no longer the appanage of any one profession, it is true. But it demands patient and protracted study as much as any other. And that the sanitation of a factory is generally a problem of greater practical difficulty than the sanitation of a workshop, I can testify not merely from my own brief experience as an inspector of factories, but from a rather extensive knowledge of the factories of Yorkshire and Lancashire, gained from special enquiries, which it has been my duty to conduct in them. In asserting that a large proportion of those factories remain, after fifty years of state regulation, badly ventilated, I am quite confident of speaking with moderation and with safety.

Therefore the second change I would advocate is the assimilation of factories, so far as sanitary inspection is concerned, to workshops: that is to say, their subjection to the Health Authority of the district, whose officer should be instructed to visit them, in the ordinary discharge of his duty, and not, as at present, on the special invitation of the Inspector of Factories.

Those two changes excepted, I have but little hope for

the remedy of the grievous evils connected with the condition of women in workshops, and above all in domestic workshops, from a further extension of minute inspectorial supervision.

For these evils, two remedies remain: one immediate, but imperfect; the other radical, but slow. The first is the extension of women's Unions. Notwithstanding the energy and devotion of the ladies who have been endeavouring for the last ten years to promote them, it is impossible to ignore the fact of their slow growth. The Trades Congress last year included delegates from Unions containing more than half-a-million of operatives. In this large number I find seven women's Unions; in which, however, the total number of members was only 850, or one-and-a-half per cent. of the whole. I do not think that women are well adapted by nature for organised fighting. The difference in the rate of mortality from accidents between girl-babies and boy-babies in the second and third year of life would seem to indicate a greater power of mischief in the male infant, which means, I suppose, an innate aptitude for fighting, that cannot be explained away by education or circumstance. Nevertheless, as I admire the women of Carthage, who in the last fatal hour of their city, cut off their long hair, and wove it into ropes with which to work the catapults; so I sympathise with, and would willingly help, the poor tailoresses, the upholstresses, and sempstresses of London, who are striving to shelter themselves from the terrific deluge of industrial competition in their little arks of union.

The real and radical remedy for the evils complained of would seem to be an organised concentration of public opinion on the condition of low-paid labour such as I believe to be far from hopeless, and such as would lead a skilled workman to refrain from ordering his clothes at a slop-shop, or a fashionable lady from changing her fashion rapidly, or ordering her dress in a hurry. I do not despair of a time when, through the wide diffusion of sound principle on this matter, the skilled mechanic and the rich lady,

and every one of us, rich and poor, shall be restrained by the unwritten law of conscience from purchasing any article for which there is reason to believe that the maker of it has not been duly paid, or has been unduly worked. But to discuss this would lead me far beyond the limits of this paper, which therefore I now conclude.

DISCUSSION.

Mr. JOHN ARNOLD wished to say a few words on behalf of the unfortunate girls who worked in drapers' and milliners' shops, and whose case did not seem to be touched by the paper. He must say after being in the southern states of America during the time when slavery existed there, that the scenes he had witnessed there, and the horrors he had known to exist, were quite equalised and surpassed by the cruelty and danger which resulted to young girls in situations such as he had referred to. They were employed in close stuffy unhealthy buildings, not like workshops, where every sanitary regulation was enforced, and where there was a certain amount of air, and he had known them to be on foot from half-past eight in the morning until half-past twelve at night, and that continued for six days in the week. He knew many painful instances in which young girls had been entirely ruined in health and morals by these conditions. The Factory Acts did not touch them, nor did the Master and Servants' Act. These girls had not only to work hard, but they might be turned off at a moment's notice, and as many lived in the country, miles from London, he would ask what condition must they be in turned out into a large city without any means to take them home. He trusted that something would be done for this large and suffering class.

Mr. EDWIN CHADWICK, C.B., said he had been a Commissioner to inquire into the labour of young persons in

factories in 1833. The commission was to inquire as to the labour of children, a ten hours' Bill being then demanded for them alone. The Commissioners, however, said that ten hours was too long for little children to work, which was as destructive as working young colts the same stages as old horses, and that six hours was quite enough, and that the employers must work with double sets. That enactment he succeeded with his colleagues in getting passed, and also another, namely, that as a condition of children being employed in factories they should bring a certificate from a competent school teacher that they had been to school three hours a day in the week preceding, which prevented the children being worked in two sets the same day in different mills, and this led to the first introduction of the half-time system, which had been since widely spread. At the time there was a great deal of opposition to the measure, which was aided by some political economists, who said that any restriction on the long hours then prevalent, chiefly in the smaller mills, would affect the duration of adult labour and be detrimental to the factories of the country in their rivalry with unregulated long-time labour elsewhere. Since then, however, restrictions had been put upon the time during which adults might be employed, and later on the employment of adults was practically restricted to ten hours; but it was now proved clearly that the long hours of the foreign factories abroad gave them no advantage in production over this country, where the machinery was speeded and the work more energetic. In fact, the cost of production of cotton goods in Lancashire now was lower than anywhere else, and, apart from protective duties, Lancashire manufacturers could control any neutral market whatsoever. A connection of his had given him the following figures:—Many years ago, or at the beginning of the century, the wages paid were 14*s.* and 15*s.* a week to a family of three, whereas now a nephew of his, a manufacturer, paid 40*s.* a week to three workers living in one cottage. At the earlier period the cost of spinning

a pound of cotton of a given number was one shilling, but now, with the 40*s.* a week wages, the cost was reduced to three farthings; and now the lowest cost of production was obtained at the highest wages; a most satisfactory result. Some of the recommendations of the Commission to which he had referred still remained to be carried out. His opinion was at that time that the regulations of labour and all the conditions of labour, the cleansing of the manufactory, and so on, was, in principle, a sanitary measure. The diminution of bodily injury from over-work came under the same category, and that properly the inspection should be by sanitary officers. Many of the present factory inspectors were very able men, and he did not think there would be any material benefit by removing some of them, but still his conception was this, that a workshop should be visited once a week by an Officer of Health, who would inspect not only the shop but the persons engaged in it; and in case of an outbreak of infectious diseases he would detect the premonitory symptoms, and would order the removal of the workmen suffering from them, would follow them to their homes, and see if the conditions there were such as they should be, and thus the further progress of the disease might be stayed; so that the inspection would be more completely sanitary and more completely preventive in every way. The service of the Health Officers was a measure of the foremost sanitary importance to press.

Professor DE CHAUMONT said Dr. Bridges' paper was a most valuable one, all the more so because it dealt with the question in a really philosophic spirit. It had shown clearly what must be the limits of legislation, but people were sometimes apt to fly to legislation as a panacea for all evils. In some cases legislation was absolutely necessary, but if it were driven too far it would simply arouse the feeling of the nation against it and create a dead-lock. With regard to the remarks made by Mr. Arnold on the overwork of young girls in shops, he thought everyone must sympathize most fully with his feelings in the matter,

but the difficulty of applying legislation to such a case had been shown by Dr. Bridges. There was, however, every hope that as knowledge progressed and a better conscience on the part of the public increased, those evils would be put an end to, because it was an evil not confined to the unfortunate victims themselves; for these unfortunate girls must be the mothers of a future generation, and if they were worn out now we could only expect a weakly generation to follow, and the country would certainly sink under the weight of such a great misfortune.

Miss BEWICKE wished to refer to one sentence in the paper, in which Dr. Bridges gave it as his opinion that if the women of Lancashire were to vote by ballot on this question they would vote in a certain way. She wished to suggest that something of the kind should be done, and to protest against any legislation being passed in this matter by men before the women had had the opportunity of expressing whether they did want to be legislated for differently from men. It always seemed to be assumed that there was to be some special provision for women on account of their being the mothers of a future generation; but she wished to point out that the present sanitary statistics showed that the mortality amongst men was far greater than that amongst the women, and therefore she did not see the justice of interfering nominally to protect the health of women at the risk of slow starvation or driving them into vice.

(The Conference then adjourned until 3 o'clock to-morrow.)

Conference on Friday, June 27, 1884.

The Conference resumed its sittings on Friday, June 27th, 1884, at 3 o'clock, when Sir Richard Temple again took the chair.

SUBJECTS FOR DISCUSSION:—

1. "*Is it desirable that Notification of Infectious Disease should be Obligatory?*" By G. W. Hastings, M.P.
2. "*Is it desirable to Legislate further respecting the Duties of Medical Officers of Health?*" By A. H. Brown, M.P.

The Chairman said the first paper would be read by Mr. G. W. Hastings, M.P., and it would be superfluous for him to introduce that gentleman to the Conference, for not only had he promoted the cause of social science from the very beginning during nearly a whole generation, but he had identified himself for fully a quarter of a century with all those social reforms which most nearly concerned the welfare of the people.

IS IT DESIRABLE THAT NOTIFICATION OF INFECTIOUS DISEASE SHOULD BE OBLIGATORY?

By G. W. Hastings, M.P.,

Vice-President of the Social Science Association.

The question of the Notification of Disease originated, so far at least as any public interest in it is concerned, at the Brighton meeting of the Social Science Association in

1875. On that occasion a paper was read advocating a system of return of all cases of infectious sickness, as they occurred, to the medical officer of health of the town or district, with a view to the prevention of further infection. The subject was reported to the Council of the Association, and approved by them. Since that date some system of notification has been adopted in no less than thirty-eight towns of Great Britain; and a useful table, reprinted by permission from the 'Sanitary and Medical Records Diary' for 1884, is laid before this meeting, specifying the various conditions under which, in those towns, notification of disease is carried out. I am able, as a member of the Standing Committee of the House of Commons on Police and Sanitary Regulations, to whom all local and personal bills bearing on health (among other matters) are referred, to state that several towns will under the legislation of the present Session receive similar powers. It is the fact, therefore, at the present moment that upwards of forty towns have thought it well to adopt a plan for notifying infectious diseases.

You will see, therefore, that during the nine years which have elapsed since the question was first publicly mooted, this measure has passed altogether out of the region of theory, and has become a matter of practical legislation and experience. It is too late to say that notification of infectious disease cannot be carried out, for it is in force as a fact among some millions of our population, and is carried out daily. It is too late to say that no one knows what the effect of notification will be, for everyone who will take the trouble to inquire can ascertain what its effects have been and are in a number of the chief towns of Great Britain. The real questions for debate now are, whether in place of multiplying local legislation a general Act for the Notification of Infectious Disease should be passed by Parliament, and what specific provisions for ensuring due notification should be embodied in such a measure.

I have said that we are dealing with a matter of experience, and I will adduce to you, as a sample, the experience

of the City of Edinburgh. For more than one reason, the example of Edinburgh is peculiarly instructive. It has a large population and a considerable trade, and therefore affords a fair field for an experiment of this nature. But more, its population is exceptionally educated and intelligent, and must be capable of knowing what is or is not for its good. It is the seat of a High Court of Justice and of a great University, and numbers among its residents more than one class of distinguished ability and independent position. It would be hard to conceive a city less likely to submit to oppressive and harassing interference with private rights. But again, the system of notification in Edinburgh is by the hand of the medical attendant. This is significant. We are always being told that the medical profession is opposed to this system ; that it is derogatory to their dignity, damaging to their interests, and can never be acquiesced in by them. Now I venture to affirm that there is no city, I do not confine myself to saying within the bounds of Great Britain, but within the limits of the civilised world, where the medical profession is more influential than it is in Edinburgh. The medical faculty of the University has been famous for centuries, and the city has become the natural home of medical genius and distinction. If the notification of infectious disease by the medical attendant is carried out successfully in Edinburgh, it is rather hard to believe that the medical profession has any valid ground for resisting the system.

Now I have the authority of Dr. Littlejohn, the able Medical Officer of Health at Edinburgh, for stating that, from the month of November, 1879, when the system was first put in force, to the end of the year 1883, there had been made to him by medical practitioners in that city 21,710 notifications of the existence of the following diseases:—Typhus, typhoid, diphtheria, smallpox, scarlatina, and measles. And from the first of January last up to Wednesday in this week the notifications had been 3348 in number. This information has been given with the full approbation of the medical profession and its authorities, of

the hotel-keepers and lodging-house keepers, and of the inhabitants generally, numbering close upon a quarter of a million. Dr. Littlejohn remarks that the repeated existence of smallpox in an epidemic form in London, and also in Glasgow, has necessarily exposed Edinburgh to attack; and that within the last few years repeated entrances of smallpox, no less than nine or ten in number, have taken place; but that notification has led to prompt isolation of the cases, and that consequently in no single instance has any outbreak of smallpox taken place. Let the inhabitants of London, now once more harassed by an epidemic of smallpox, ponder well how much suffering and loss might be saved to them, as they have been saved to the wiser population of Edinburgh, by the early notification of infectious disease.

Great benefit has also been reaped by the notification of typhus, and indeed Dr. Littlejohn is of opinion that in respect to no disease has the system been more beneficial. The opponents of notification tell us that the sanitary improvement attributed to it is the result of other causes, such as improved drainage, water supply, and a better knowledge of sanitation. It is therefore worth noting that in Dr. Littlejohn's opinion, typhus, which he speaks of as "the great and notorious scourge of Edinburgh in former days," has shown no signs of having assumed a milder type. It is as infectious as ever; and in the late numerous outbreaks, he says, it was evident that had not the cases been early and systematically reported to the authorities, thus admitting of their speedy removal to hospital, the disease would have become epidemic, and have entailed a heavy loss on the citizens.

Such is the experience of the capital of Scotland. Similar testimony, more or less, could be given by the various cities and boroughs whose authorities have obtained from Parliament *privilegia* for thus protecting their inhabitants from disease. The best testimony to the efficacy of the legislation is the fact that Session after Session fresh applications are made, necessarily at considerable expense,

by municipalities for these powers. The Committee of the House, to which I have alluded, have been so struck with the benefits of notification, as detailed to them again and again in evidence, that they have framed model clauses to carry out that purpose, which are now usually inserted in local Acts. What seems to be further required is a General Act, applicable to the whole country, embodying these provisions. Many agree with the opinion expressed some time since by Sir Charles Dilke, that it would be well to make such an Act permissive, so that the towns and districts throughout the realm could adopt it as they found it convenient to do so. But that the present state of things, under which populous and wealthy communities can obtain, by special legislation, an advantage from which poorer and smaller populations are debarred, can be suffered to continue, it is impossible to believe. If the system of notification is beneficial, as those who have tried it affirm that it is, let all subjects of the Queen be placed within reach of the benefit. I may be permitted to say that during more than one Session of Parliament I have done my best to bring about this public good. But a private Member of the House has little within his power. The President of the Local Government Board has shown that he understands the importance of the subject, and I should be glad indeed to see it in his capable hands.

DISCUSSION.

Mr. JAMES BAILEY (Secretary to the Vigilance Association) said they were all much indebted to Mr. Hastings for the very able paper he had read. He did not think too much importance should be attached to the fresh applications made by communities for the private bills as referred to in the paper, and for the application of powers of compulsory notification, because they all knew that many of

these private bills were launched in a very peculiar way, without much interest on the part of the community affected by them, and it was quite within the power of a clever and able Medical Officer of Health to lead a Corporation to a certain extent by the nose. He did not say that Corporations were all led by the nose, but it was quite possible that being human beings they might be so led, and no doubt in some cases they had been. It was notorious that the great body of the community did not take any particular interest in such questions as this; they knew nothing about it. The great mass of the people were as a rule too ready to be dictated to by experts, and to accept as gospel that which was said by professional men. Mr. Hastings said it was too late to say they did not know what the effect of notification would be, and he quite agreed with him. Its effect was extremely small, practically *nil*, as far as stamping out zymotic diseases was concerned. The advocates of compulsory notification were continually alleging that it was working well, and to a certain extent it was, but what was the meaning of that "working well?" It meant that the existing law being put in force by the community, people generally, blindly, and unthinkingly submitted to it, and also that there was no friction between the medical officers of Health and the members of the profession generally; but these statements about working well did not refer to the stamping out or diminution of zymotic diseases. Mr. Hastings made a great deal of the case of Edinburgh, and he was perfectly right in so doing, because Dr. Littlejohn was one of the most zealous advocates of this measure; but in reply to what had been said he would desire to read a short passage from a pamphlet on the compulsory notification of infectious diseases by Dr. Robert Hamilton, Senior Surgeon to the Royal Southern Hospital of Liverpool. [The extract alluded to was decidedly opposed to the working of this measure, and intimated the opinion that it was a decided break-down so far as regarded stamping out epidemic diseases.] In his opinion compulsory notification would tend to defeat

itself, because if a compulsory law were passed a large number of people would at once oppose themselves to it, and would endeavour to conceal cases of disease rather than let them be known. At the back of this stood the question of compulsory isolation, and if that were attempted it would be denounced and resisted by the upper and middle classes, and would result in class legislation of the most odious and offensive kind. With regard to removal to hospitals, they all knew from the statements of medical men in the highest ranks of the profession, that a removal to a hospital damaged the chance of a recovery, and also created *malaria* and infection in the district where the hospital was situated. Under those circumstances he thought it was a great mistake for the community to be induced to support the passing of any general law on the subject.

Mr. WILLIAM YOUNG (Secretary to the Society for the Abolition of Compulsory Vaccination) said he much regretted that the few words he had to say had not fallen to abler hands, but having had some experience of the difficulty of getting Acts of Parliament repealed, he was of opinion that no efforts or sacrifices were too great to resist this mischievous projected legislation. In the first place, he held that the promulgators of this law had not proved the preamble. These diseases were not infectious to the extent they would have people believe, and the deaths from these zymotic diseases, which were to be dealt with by this law, were as a mere nothing compared to the total mortality, and every year, under increased sanitary legislation, they were diminishing. What were those diseases—small-pox, scarlet fever, and measles—compared with the devastating plagues of the middle ages? But those had all disappeared under the influence of improved sanitation, and therefore he contended that towards the end of this century, when we are getting on very well without this legislation, there was no reason why we should be saddled with it. It was for these gentlemen to prove that those diseases which they wished to control in this oppressive way were so

dangerous. He had had a great deal of experience in the treatment of these diseases, having been engaged for twenty years in poor neighbourhoods as a chemist and druggist. Although chemists did not hold themselves out as medical men, or visit or act as medical men, the poor would consult the chemist in the little ailments of their families, and got great relief; and he had treated hundreds of cases of measles and scarlet fever without, as far as he was aware, those diseases spreading to the neighbours' children. If this legislation had been in force, he should have made a nice little fortune by having 2*s.* 6*d.* for each notification. What he had heard about this in Edinburgh, was that if poor persons did not comply with the Act, for the rich were exempt, Dr. Littlejohn posted a policeman at the door to warn people there was noxious disease in the house. What became of the voluntary system if such things as that were done? It was easily explained why this was advocated—there was a fee of 2*s.* or 2*s.* 6*d.* for each notification, and you could get men to do anything for money; money was really at the bottom of this legislation. He only regretted that he had not been called upon later, after some of the medical men had spoken in favour of the scheme. He saw there the medical officer for Kensington, and he would ask him, with regard to zymotic diseases in that district, whether it was not the fact that in the better parts of the parish they were comparatively rare; but in the poorer neighbourhoods, where sanitary defects were abundant, and the people were a great deal more crowded, he got these infectious diseases? His idea was that this legislation was absolutely derogatory to the medical profession. What would the great physicians of the past have said if they had known that their followers would be ready to make themselves the tools of a police system of espionage. If he were a medical man, he would resist it to the death. The way to diminish the death-rate from zymotic disease was to continue in the path of sanitary improvement in which they were now going, and more reliance ought to be placed on sanitary

engineers than on physicians. A great deal was talked about preventive medicine, but that was a paradox; there was no such thing. What could be the meaning of preventive medicine? He had never met with anyone who could give a meaning to it. If preventive medicine meant sanitation, they did not want physicians, but sanitary engineers, and men like Mr. Chadwick, who devoted themselves to improving the health of the country. He would give one illustration of the way this Act would be worked. It would mean the death of the poor, for the poor only would be subjected to it. He knew a case of a comparatively poor woman, who occupied rooms in a Peabody's building in St. Luke's, who, on the 21st of August last, was confined with her first child; she was attended by a doctor, who two days after found she had a rash. He diagnosed the case as one of smallpox, and fetched in two inspectors to corroborate him. Fancy bringing two male inspectors into a woman's bedroom just after she was confined. They confirmed the diagnosis, and they ordered the woman to be taken to the small-pox hospital two days after the confinement; and though the woman's mother appealed to him, he said it was more than his place was worth to leave her there. She was taken to the hospital, leaving her infant behind, and died in consequence a few days after. Was that the way the poor were to be treated? The paltry excuse made was to prevent infection spreading to other inmates; but the whole thing was absurd, because all the other inmates of the building, as a condition of admission, had to show that they were vaccinated, and if there was any truth in vaccination, how could this one woman infect the whole community? He did hope that the citizens would uphold their rights and oppose medical despotism and the priesthood of medicine, just as much as their forefathers had opposed the despotism of ecclesiastics.

Mr. Alderman POLLARD (Chairman of the Sanitary Committee of Halifax) then gave a short account of his experience of the working of the local Act obtained in that town. He thought an ounce of practical illustration was

worth a bushel of theory. Some years ago they tried to get inserted in an Act of Parliament the power to compel medical men to notify any case of infectious disorder which came under their notice, but the influence of the medical profession was so strong on the Committee who had control of the Bill, that they persuaded them it would be very injurious, and they used very much the same language as that employed by the last speaker. He was pleased to say however in the course of time, through repeated suggestions of the Sanitary Committee, they had at last got the desired power, and they found that instead of there being any fear on the part of the public that the medical profession should know they had cases of fever in their houses, it had been exactly the opposite. Before they had the Act a woman was taken with fever, and though she recovered, the husband was taken with fever afterwards and died; their own child took it and died, and directly after that the wife sold everything in the house to the neighbours without any disinfection, and the consequence might have been to spread the disease to dozens of people, but since this Act was obtained the deaths from zymotic disease in the town of Halifax had been less than in almost any other town in England, and he attributed the cause to this compulsory notification more than to anything else. He felt so fully satisfied about this that he was sure the day would not be far distant when every town would be compelled to have this notification by medical men, and the sooner they had it the better. They had not had a single instance of unwillingness on the part of medical men to notify the existence of these diseases to the sanitary authority, and as soon as the medical officer or inspector had the information the place was immediately visited; and if they could not persuade them to send the patient to the fever hospital, every care was taken to disinfect the house. Instead of the theory set up against this proposition being true, it was proved by facts that there was not the slightest opposition now by medical men, but they appeared to be ready to give information immediately. Another advantage in Halifax

was this, that they had there the system of pail closets, and whenever a case of fever or small-pox was reported care was immediately taken that day by day everything which came out of the house was removed immediately, which was a most important means of preventing the spread of disease. Although they might have spent some £50 or £60 in paying fees of 2*s.* 6*d.* to medical men for sending notice, his impression was that they had saved not one but dozens, and he firmly believed that the saving of life to this country would be enormous as soon as such an Act came into general operation.

Dr. DUDFIELD (Kensington) said he was very glad that the Chairman had called on gentlemen who were opposed to this system immediately after this paper was read, because the great object they had in view, now, was not to convince educated or medical judgment, but to remove popular objections. He hardly knew how to set about doing that because it did not seem as if a demonstration of the success of the system would remove the objections of those who, standing by the principle of what they called the liberty of the subject, were averse to the plan of notification, otherwise his experience in Kensington, alone, under the present very imperfect system of voluntary notification might suffice to satisfy those gentlemen. In the course of the last twelve years the deaths from typhoid fever and scarlet fever, after correction for increase of population, had been about 1400 less than they would have been in the same period had the mortality been at the same rate as in the previous twelve years. This had resulted partly from notification of a voluntary character, by the Registrars of deaths, by the Guardians of the Poor, by the School Board, the Police and the Post Office authorities, and partly, very largely indeed, from the system of hospitals which had been provided by the Metropolitan Asylums Board. During the last twelve years there had never been any difficulty whatever in finding a hospital to which any poor person suffering from either of the dangerous infectious diseases could be taken, and he was happy to say that as a general

rule persuasion had sufficed to obtain isolation of the sick in hospitals. It had seldom been necessary to put in force the powers of the law, and compel persons to go to a hospital when they could not be safely isolated at home. But these powers at present were altogether inadequate, for it had been decided in a court of law that accommodation was only required at present to be sufficient for the individual sick person, and the safety of the public was a matter of total indifference to the law as it then stood. Those who opposed compulsory notification maintained that the individual should be protected at the cost of the community, whilst he contended on the other hand that the community ought to be protected at the cost of the individual, if cost there were; but in reality there was no cost, for he altogether disputed the accuracy of the statement that the mortality in hospitals was greater than at home. The fact was that the worst cases went to the hospitals, which to a certain extent made the mortality appear somewhat large, the cases not so serious being commonly kept at home. It might also be stated that the most democratic communities of the world were the most resolute in enforcing the notification of disease and isolation in an hospital when the patient could not be treated at home with safety to the community. The liberty claimed was liberty to spread disease, and he had had within the last two or three weeks a very striking illustration of the wretched consequences which too frequently resulted from non-isolation at home. The fact was that poor people did not understand the danger of infectious disease until they got hit very hard. The other day in a particular house there was a case of small-pox, and the parents who objected to doctors called in no doctor, the case being a very mild one; but at the end of a fortnight the disease had extended to the father of the child, who was now in the hospital, to another father in the same house, who was also in the hospital, and altogether in that one house there had been nine persons stricken with small-pox as the result of concealment of the first case. From that single illustration might be inferred the great damage done to the community by

concealment of infectious disease. Compulsory notification without the provision of hospitals was somewhat delusive, and if there had not been the amount of success in some of those places where notification was practised that might have been expected, it was because the local authorities had not provided proper hospital accommodation; and he must say, as regarded Edinburgh, that he had been astonished to find how small a proportion of the cases notified had gone into hospital. It was owing to this want of isolation in hospital that infectious diseases had not been reduced to very much smaller proportions than they had been. He was happy to say that in Kensington they did succeed in one way or other, mostly, as he had before said, by persuasion, in getting the greater number of cases removed to the hospitals, and it was to that circumstance mainly, following on voluntary notification, that he attributed the great reduction in zymotic diseases during the last few years. He had hoped to hear something in the nature of objection to the system which he could answer and explain, but as a matter of fact there had been nothing of the sort; he would therefore pass on to say that the principle of compulsory notification had now been practically accepted by the sanitary authorities in London, and the medical profession was all but unanimous in favour of it. The only difference of opinion was as to how it should be done? Medical men were very averse to making the necessary communication directly to the sanitary authorities. The British Medical Association at several meetings in recent years, when the matter had been brought forward, had committed itself absolutely to the principle, but urged that the doctor should not be compelled, as a matter of legal duty, to report the cases direct. His own impression, however, was that the system would never work well until that was done, but at the same time he was quite content to begin by requiring the medical man to notify the householder, or head of the family, and throw on him the burden of making the communication to the sanitary authority. The matter had been before

Parliament on more than one occasion, and a Select Committee having very carefully considered it in 1882, reported that they had no difficulty in arriving at the conclusion that great benefits had followed from notification, and about twelve months ago when he accompanied a deputation to the Local Government Board, the President of the Board said that they were so satisfied of the advantages of notification from the experience acquired in places where it was in operation that the deputation need not address themselves at all to the question of principle, but rather to advising what was the best way to do it, as the Board did not see their way at present to a compulsory Bill: they seemed to be rather in favour of a permissive measure, which the local authority could bring into operation, and he hoped that such a measure would be passed as quickly as possible.

Miss BEWICKE being called upon, said she had nothing to say; but she had handed up a question which she should like to have answered.

Mr. HASTINGS said the question seemed based on a misapprehension of fact, and therefore it was difficult to answer. It asked what penalty would attach to the Medical Officer of Health if he reported incorrectly. It was not the medical officer who reported these things; it was the medical attendant or householder who reported to the Medical Officer of Health. He did not see how it was possible to say that a penalty should attach to a medical officer because some one else had made a mistake in writing to him.

Miss BEWICKE said the question she wished to put was, if the officer, who was compelled to report a case of sickness, reported it non-contagious, which was a mistake, such as often arose at the outset of an illness, when it really was contagious, would there be any punishment for him if a number of deaths arose in consequence, because, unless there were, she could not see that the private householder would gain any protection from such an Act.

Mr. HASTINGS said he did not know there would be any penalty on a medical man for making a mistake, any more

than there was on a lawyer or a clergyman. Every one made mistakes sometimes.

Dr. WALLACE (Medical Officer of Health, Greenock) said he only got notice of this meeting the previous day, and therefore was not prepared with documentary evidence to support the conclusions he had arrived at. The town of Greenock was the first in Scotland which obtained the powers of compulsory notification. The local authority there, in consequence of the very frequent and lamentable outbreaks of infectious disease, had for a considerable number of years seen that there was an absolute necessity for doing something in the way of obtaining early information of the occurrence of such cases. In fact, these diseases were the cause of the great mortality for which Greenock was for many years notorious, and some idea of their prevalence might be gained from the fact that the death-rate had at one time run up to 40 per thousand. In 1877 the local authority promoted a Bill, in which was included a clause that notification should be made compulsory on medical men. The medical gentlemen in the place were unanimous against these propositions, and as an alternative, seeing that there was no precedent in Scotland or in England at that time, the local authority came to a compromise, by which notification was rendered compulsory on the householder. The result of the Act, which came into operation in 1877, had been so far on the whole satisfactory; at the same time it was not so satisfactory as he could wish, because, although they did get notification, taking one year with another, about 50 per cent. of the cases reported from householders, in a considerable number of cases the notification came too late for anything like energetic or useful action to be taken. At the same time they had now nothing like the tremendous epidemics of typhus fever which used to decimate the population, and which were so grave that in one year no less than five medical men, all young, in the full bloom of life, were cut off by the disease. They had proved incontestably, with reference to scarlet fever, not only that the notification of

disease had reduced the general mortality, but that the mortality in a hospital was less than in private practice. At present there was a Bill before Parliament for Scotland, which was under the charge of the Lord Advocate, in which the notification was to be made conjointly by the medical attendant and the householder. He did not know whether the Lord Advocate would succeed in passing it, but he certainly thought it would not make any great advance in improving the public health until notification was compulsory on the private practitioner as well as on the householder. One gentleman had made a reference to Edinburgh, and quoted Dr. Hamilton's pamphlet, a pamphlet which tried to depreciate the efforts of Dr. Littlejohn and the local authority in Edinburgh with regard to stamping out infectious disease. One great advantage which had resulted in Edinburgh was this, that Dr. Littlejohn had been able to show to the inhabitants that there had been such an amount of infectious disease which was likely to continue that it was imperatively necessary for them to increase their accommodation for the treatment of such patients, and at present the local authority were carrying out his views and constructing a fully equipped hospital for the treatment of those diseases. In Greenock, in addition to the hospitals, they had a couple of houses to which they sent parties who had been in close contact with a case of infectious disease, where they resided for such a time as was necessary for the proper disinfection of their clothing, and so forth. He believed they were the first to adopt that system, though he was happy to say it had now been followed elsewhere—in Glasgow, Edinburgh, and in Dundee. Without that accommodation, with such a population as they had, he did not think that even compulsory reporting and the possession of hospital accommodation would have enabled them to do very much. In comparing one town with another, it was necessary to have regard to matters which it was very difficult for any one not on the spot to be aware of. To compare a place like Greenock, which was the first landing port for the Irish,

and also a place of resort for numbers of poor Highlanders, with such a place as Edinburgh, the population of which was composed largely of professional men and persons of independent means, was absurd, and what obtained in Edinburgh could not be predicated with reference to such a place as Greenock. Still, the mortality, which had been sometimes as high as 40 per thousand, had now been reduced to about 22 per thousand; and he had not the slightest doubt that, if notification were made compulsory on medical men, in five years hence it would be reduced to 17. He did not approve of the principle of permissive legislation, and, to give an idea of the danger of it, he would take his own town, where on the one side was Port Glasgow, and on the other Greenock, and if those two places had not the same system in force, whatever they might do in Greenock to stamp out scarlet fever and similar diseases, they would consequently be having them brought in from one side or the other. Therefore, to do anything effective in this way, it ought to be compulsory over the whole country; and therefore, to object to this system because an eminent practitioner had not succeeded in stamping out infectious disease in a place like Edinburgh, was perfectly preposterous and absurd.

Professor DE CHAUMONT said he thought this subject was pretty well thrashed out at the Conference a fortnight ago; but he did not regret its having been brought forward again, since it showed most clearly that even the objections brought most prominently forward last time had lost a good deal of freshness and point. He had no doubt that compulsory notification was necessary, and that before long they would have it. At the same time, such legislation must be carried on with great care and tact. He was as strong an advocate of the liberty of the subject as any gentleman who had spoken, but he drew a line with regard to that liberty. He did not like his neighbour to have liberty to infect him with disease to please himself; and you could never feel safe while your neighbour's house was burning. It would be unnecessary to say another word on

the subject on which he was going to remark, before an audience well acquainted with the matter ; but it might be as well to enter a distinct protest here, especially addressing himself to those who had not studied the question, against the idea that this notification of disease had been got up as a means of personal aggrandisement on the part of the medical profession. Nothing could be more ridiculous. He would ask the gentleman who brought it forward if he thought 2*s.* or 2*s.* 6*d.* such a tempting fee that a man would sign his soul away for that sum. With regard to the general question, if people only reflected upon it for a moment, they would see that of all things medical men could possibly do, it would be the worst for their own pockets, because it would prevent disease, and therefore practice for themselves. Mr. Young had said that the term preventive medicine was a misnomer—that he did not know what it meant. Now he (Prof. De Chaumont) had been teaching preventive medicine for twenty years, and ought to know what it meant. This statement arose from the erroneous idea of what medicine meant. Perhaps that gentleman did not know the meaning of the word "medicine;" being a chemist and druggist, probably he thought it meant castor oil and salts and senna ; but the word "medicine" really meant knowledge, and knowledge by measurement. They measured the distance an infectious disease could go, and then they knew how to prevent it. That was preventive medicine. The statements made on the part of certain persons were most preposterous. Some people said they did not want medical men at all ; they wanted sanitarians and sanitary engineers. They were all useful, no doubt ; but where would the sanitarian be without the medical man ? This reminded him of a question which was once put to a yokel as to which was the more useful, the sun or the moon. He said, "Oh the moon was the most useful, because he shone at night when it was dark, but the sun only shone in the day when there was plenty of light." Medical men had been shedding light upon the world on these sanitary questions for years, and now people had got

so accustomed to it they thought it came by nature, and wanted to extinguish the luminaries which had produced it.

Mr. G. W. HASTINGS, M.P., in reply, said the observations made by the last speaker and others who had taken part in the discussion was such a complete answer to what had been alleged against his proposition that it was hardly worth while to say anything more, but still he should like to point out strictly in reply one or two erroneous impressions which seemed to prevail. He always concluded that every speaker who made a statement did so in entire good faith, believing it to be true, and he should act on that idea at the present moment. Therefore he supposed it was with an entire belief in what he said that Mr. Bailey stated that local and personal Acts which had been brought before the Sanitary Regulations Committee of the House of Commons were brought there without the people, whom they affected, having any knowledge with regard to them. Now he was a member of that Committee, and he did not think it had sat often without his being present; certainly no Bill had passed without his taking an active part with regard to it; and the first question they always addressed themselves to with regard to any one of these Bills was whether ample notice had been given to the population of the town whom the Bill would affect. They examined witnesses on oath to prove that ample notice had been given, that public meetings had been held, that handbills had been profusely distributed, and that every possible means had been taken to give the people warning that a Bill was going to be sent before the Houses of Parliament which would affect their interests as ratepayers, and which they had a right to oppose if they thought fit to do so; and he ventured to say that in no single case had these clauses for compulsory notification of disease been put into an Act without every man, woman, and child in the town to which they were going to apply having had notice given to them. He said, therefore, it was totally impossible that the population of these towns could be ignorant what was going to be proposed with regard to them. Then the City of

Edinburgh was referred to, and it seemed to be supposed that this pamphlet, which he had seen before, and a rather foolish pamphlet it was in his humble opinion, had disposed of Dr. Littlejohn. He would simply put it as a matter of common sense, if they wanted to know what was the effect with regard to what was going on in any town, and whether any measure affecting it was successful or not, to whom would they go? would it not be to somebody living in the town, and knowing something about it? He produced the evidence of Dr. Littlejohn, who resided in Edinburgh, the medical officer for the city, and then it was said, "Oh! he knows nothing about it," and they produced Mr. Hamilton, who lived in Liverpool, to contradict Dr. Littlejohn. Then it was said that zymotic diseases had not been kept out of Edinburgh. He stated on Dr. Littlejohn's authority that smallpox had been kept out for years from Edinburgh when it was epidemic in London and Glasgow; that though sporadic cases had necessarily been introduced by people coming there, owing to compulsory notification Dr. Littlejohn was immediately informed, and those cases were promptly isolated, and that in no one single instance had smallpox spread, and as a matter of fact smallpox had never been epidemic in the city of Edinburgh since this system of notification came into operation. Yet, in the face of such a fact as that, they were told that this measure did not affect the spread or incubation of zymotic disease. He could only say that there was no means of reasoning with people who could make statements of that kind. They could not know what they were talking about, although they were speaking with all sincerity no doubt, and believing what they said was true. Then an observation was made by the anti-vaccination gentleman—and he would observe that the opponents of this measure were people who were *anti* everything else, people who thought that smallpox ought to be allowed to spread as much as possible—which was as cruel as it was absurd. This gentleman said notification was to oppress

the poor; it was not to touch the rich, but to be solely applied to the poor; and to give a proof of it he produced a fact which he said took place in the city of London, where there was no such system at all, and never had been. So that because a poor woman was no doubt most properly taken away from her home on the ground that she was suffering from some infectious disease—because that took place in a city where there was no notification it was a proof that notification was intended to oppress the poor. That was just a sample of the arguments used against this measure wherever he went, and unfortunately he heard them most in the House of Commons. In that assemblage of the collective wisdom of the nation there was no piece of nonsense which would not be talked on this question of the notification of disease, chiefly because those who talked about it had not taken the pains to learn the simplest elements of the question, and knew nothing in the world of what they were speaking about. They never seemed to master the fact that infectious disease was disease that spreads, that it was a pestilence, and if you did not check it it would injure the whole community. Therefore, for the sake of the community, to save the lives and health and well-being of men, women, and children, the medical attendant was called upon simply to inform in writing the Medical Officer of Health that such and such a case had occurred in his practice, that then prompt measures of isolation might be taken, and that innocent people not already infected might be preserved from the disease. No glimmer of this fact seemed to have crossed the minds of those few Members of Parliament who prevented this benevolent measure being passed into law. They thought it was something to interfere with the liberty and rights of the people, while they really meant the liberty to spread disease and the right to kill your fellow-creatures. He had mentioned in the House a remarkable fact which had happened to himself two or three years ago when he was Chairman of the School Board of

the city of Worcester. He was one day in the school and was told that a boy in the infant school had been absent a week or ten days. On coming out of the building he met a little girl of eleven years of age coming in, and recognising her as the sister of the little boy, he asked her why her brother had not been to school. She then informed him that he had caught the scarlet fever, that he was getting better, the doctor said his skin was peeling off nicely, that she had been nursing him—that, in fact, she had been nursing him all the morning, and now she was going into the girls' school. So that here was a child absolutely charged with the poison of scarlet fever going to walk into a school of 200 children, to every one of whom she might have given that most dangerous disease. Of course he told her to go home at once, and thus that danger was averted. That imminent danger arose simply because the city of Worcester had no system of notification of disease. If it had been in existence there, the Medical Officer of Health, a most able official, would at once have gone to the house and have forbidden any child in it to go to school, or to be sent into the street to communicate disease to the neighbours. Let them mark the two examples he had given them. In Edinburgh there was a system in force under which the child would have been kept at home and prevented from spreading disease; in Worcester there was a state of things under which a child impregnated with scarlet fever could go about freely and give it to everybody else; and that was what was called the liberty of the subject. As long as he had a voice in Parliament, however humble, he should lift it up against ideas characterised by such ignorance and having such a pernicious tendency upon the community. He trusted that at least every parent, every one who had children whose lives were dearer to them than their own, would be desirous that these zymotic diseases should by a proper system of notification be brought under control, and that the future population of the country should be preserved from their direful influence.

The CHAIRMAN, in closing the discussion on this Paper, expressed the hope that the words of wisdom which had been so forcibly expressed by Mr. Hastings might sink deeply into the minds of all who heard or read them.

IS IT DESIRABLE TO LEGISLATE FURTHER RESPECTING THE DUTIES OF MEDICAL OFFICERS OF HEALTH?

By A. H. BROWN, M.P.

THE subject I am asked to introduce to you is concerning the duties of medical officers of health, and whether it is desirable to legislate further respecting those duties. But I hope I may be pardoned if I raise one or two preliminary questions which must be stated to fully understand the subject.

Everyone will admit that the labours of the medical officers under the Public Health Acts have done great good. In many districts important sanitary reforms have been quietly effected, nuisances abated, towns drained, water provided, and other reforms carried out. On the other hand, it cannot be denied that in some districts there is much room for further improvement. The medical officers have reported defects, but no action has been taken on their reports. Drainage and water supply have not been attended to, and unsanitary conditions have not been cured.

In considering this question we are met by various difficulties which are inherent in the extraordinary want of system and uniformity in what we call our local government. In a good system of local government the officers who are to have charge of the health of the county would have had assigned to them at the outset districts fairly equal in population or size, and sufficient to occupy them

entirely, and to give them a fair salary. But, on the contrary, we find great inequalities in the areas and populations of the districts under them. For example, the urban sanitary authority of Childwall has a population of 189 persons, and commands the services of one medical officer of health; while adjoining is the urban sanitary authority of Liverpool, with a population of 550,000, not considered too great for only one medical officer. Either one district is overmanned, or the other sadly undermanned. In relation to areas we find great inequalities. For instance, the single union of Newport, in Monmouthshire, enjoys the services of eight medical officers; while in the county of Salop one medical officer has charge of eleven unions out of fifteen, and several urban districts in addition.

When the Public Health Acts came into operation, nearly every sanitary authority thought it desirable to have its own medical officer, and this is still the case with a great many of them. But in my opinion the duties to be performed in any one union, and in any one of the smaller urban sanitary authorities, are too slight, and the salary which can fairly be offered is too small to command the entire services of a first-rate man. Hence, I view with pleasure the process evidently going on of combining under one officer two or more districts; for, by this process areas will be formed which will bear some relation to the duties imposed on the medical officer, to which duties he should give his whole time. To illustrate the progress made in combining districts under one officer, I will compare the Local Government Directory for the present year with that for 1877; and it will be found that though the number of rural sanitary authorities in England is nearly the same, yet the total number of medical officers employed has decreased from 770 in 1877 to 500 in 1884; a decrease of 35 per cent. in 7 years. In other words, rural sanitary districts which in 1877 had more than one officer have now only one; and many sanitary authorities, which in 1877 each employed a medical officer, now form parts of a combined district for which only one officer is appointed.

With regard to the urban authorities, many of them being large and densely crowded cities or boroughs, each of these is of course entitled to have a medical officer for itself; but with regard to the smaller urban authorities I am glad to notice that they are combining with the adjacent authorities, and for such combined district only one medical officer is necessary. By the courtesy of the Local Government Board I have received a return which shows that since 1875 what were 295 separate authorities, each of which could appoint its own medical officer, are now combined into 42 districts, with only one officer for each district. This combination has been greatly assisted and brought about by the power which the Local Government Board possess under the 191st section of the Public Health Act of 1875, to pay half the salary of the medical officers in those cases where they approve of the appointment; and it appears from the estimates that the grants given by Parliament for this purpose have gradually risen. In 1874 the grant was 50,000*l.*; it has now reached 72,000*l.*

It appears further from a paper supplied by the Local Government Board that out of 577 rural sanitary authorities the medical officers superintending the health of 527 of them are paid by Parliament to the extent of one half their salary, and with the condition that they cannot be removed by their Local Board for the term of their appointment. except with the consent of the Local Government Board. There are 947 urban authorities, and the same remark applies to the Medical Officers of Health of 579 of them. In making these remarks it will be understood that these last figures are the number of authorities, not the number of medical officers, for one officer superintends several districts, as I have already shown.

The sum of the matter appears to be that the principle of combined districts and of approval of appointment by the Local Government Board ought to be supported for the following reasons: 1stly, It secures the services of a high class of medical men, there being a wider sphere of usefulness. 2ndly, When there is a combination of districts,

a small contribution from each will amount to such a salary as will be likely to attract the services of able men. 3rdly, It removes a medical officer from the position of being entirely under the control of any one particular Board, and 4thly, It prevents his being arbitrarily discharged. The Local Government Board say in their eleventh annual report that they made several local inquiries in the course of the preceding twelve months, and "the almost invariable result of such inquiry was to confirm the view which they had previously taken that sanitary administration is much more likely to be efficiently carried out by the appointment, either for the whole area of a sanitary district or for a combination of sanitary districts, of an independent medical practitioner able to give the time requisite for the thorough sanitary supervision of the area assigned to him." I entirely concur in this view.

I now come to consider the duties which are assigned to the medical officer of a sanitary authority. These are set out in the general orders of the Local Government Board, dated March 8th and March 11th, 1880. I think it is hardly necessary for me to detail them at full length; I have endeavoured to summarise them as follows :—

1. To inform himself of everything likely to injure public health.

2. To find out the causes of local diseases, and whether they might have been removed or mitigated.

3. To find out by periodical inspection whether anything exists likely to injure public health.

4. To advise the Sanitary Authority on all matters affecting health.

5. To advise the Sanitary Authority as to their bye-laws and regulations relating to health.

6. On the outbreak of dangerous diseases, to visit the spot, find out the cause, and advise measures to be taken.

7. On report of any nuisance injurious to health, or of overcrowding, to take such steps, authorised by Public Health Act 1875, as may be necessary.

8. To order unwholesome food to be seized, and the case to be dealt with by a Justice.

9. To perform the duties imposed on him by the bye-laws.

10. To report on the means to prevent injury to health from offensive trades.

11. To attend on the Sanitary Authority at stated times.

12. To report in writing to the Sanitary Authority what has been done, and what further ought to be done, to protect public health.

13. To enter in a book his visits, observations, applications made to him, &c., and to state what has been done.

14. To prepare annual report of the sanitary state of his district, and what has been done to prevent the spread of disease, and to give tabular statements of the sickness and mortality.

15. To give immediate information to the Local Government Board on the outbreak of any dangerous epidemic disease, and to transmit to the Board a copy of each annual and special report.

16. Generally, to observe the ordinary instructions of the Local Government Board as to the duties of medical officers, and all the lawful directions of the Sanitary Authority.

17. To observe the regulations of the Local Government Board in dangerous cases of epidemic or infectious diseases.

It will be observed that the duties of the Medical Officer are, in nearly every case, limited to advising and reporting. He is not allowed to initiate any action, except in the case of unwholesome food ; and even then he only takes the first step by causing the food to be seized, in order that the case may be dealt with by a justice. The Medical Officer, to put it shortly, is to be the eyes and ears of the local Board. His duties are based on the principle that he is to be the skilled adviser of the Board, and is to bring to their notice such cases as demand action on their part. Prac-

tically with regard to nuisances and the seizure of unwholesome food, the Medical Officer and the Inspector of Nuisances are very powerful, and in these respects I think the Act works fairly well.

Here I will say one word about the relation of Medical Officers to Inspectors of Nuisances. The Medical Officer can only direct the Inspector of Nuisances when authorised to do so by the Sanitary Authority. The two are independent of each other; and unless you are to make the Inspector of Nuisances entirely the servant of the Medical Officer, I do not see that you can change in any direction the duties which he has to perform. At present he has to report all cases of nuisances to the Medical Officer, and also all cases where unwholesome food has to be seized.

In a paper read in this room, the author says, "Under the wide term 'nuisance' we can order the cleansing and whitewashing of dirty houses, the repair of roofs which let in the wet, the opening of closed or fixed windows, the repair of walls and uneven floors, the removal of closets or pig-styes abutting against outside walls, the laying or repairing of drains, the prevention of dampness as far as possible, and, in short, the abatement of any defect which is reasonably inferred to be dangerous to health." Where the difficulty comes in is when some large work, as, for instance, a costly system of drainage, is proposed to be undertaken, and when the authority often refuses to act upon the advice of the Medical Officer. This position, to an active, intelligent officer, may be a very galling one, and does give rise in some cases to considerable friction. He may see diseases arising from preventable causes, he may see villages and towns in an unsanitary condition, he may know the source of water-supply is polluted, and the water unfit for consumption; and in the discharge of his duty he reports all these. On the other side, the Board may be influenced, and in some cases rightly so, by the question of expense, of rates, and the cost to the taxpayer; and, accordingly, they very often are reluctant to act on the reports of their officer, and nothing is done. In view of such a state of

things, I am aware that some medical officers would like to have their position strengthened in such a way that when they find unsanitary conditions prevail, they might have much more extensive powers of action given to them than they have at present. But we must remember that this question of sanitary improvement ultimately comes back to the question of rates. It appears to me that any attempt to place a medical officer in such a position that he would have power to expend the money of the ratepayers without consulting the local authority would be a very serious step, and one which I am afraid would not work well. If there are difficulties and friction now between medical officers and their boards, I am sure that any such additional powers as I have hinted at would only make matters worse. It is not difficult to foresee what would happen. If a medical officer had power to carry out reforms without the consent of his board, attempts would be made to thwart him in every possible way in his demands upon the public purse. I am afraid, therefore, it would not be advisable to give original jurisdiction to the Medical Officer of Health. Another suggestion has been made to me which is that, when a medical officer and his board differ as to the necessity of any sanitary work, there should be some power given of appeal, either to the Local Government Board, or to the new County authority, which it is proposed to form under the name of County Boards. After some consideration, I doubt if this plan would be successful. An appeal to the Local Government Board would only defeat the principle of local government on which we act in this country; for the more negligent the Board, the more appeals there would be, and this could only end in making the central authority very unpopular. As regards the appeals to the County Boards, I fear this would be open to the same objection. It would weaken the County Board, which all would like to see a strong and powerful body. It has been suggested to me that possibly medical officers of health might be made county officers, excepting of course for the large towns. The way in which districts are being com-

bined, and larger areas assigned to medical officers would appear to point in this direction. But I do not see that much would be gained; for, after all, this would not get over all the difficulties, and the Local Board would have to bear the expense of the sanitary measures recommended, and they would do as they do now—oppose on the ground of expense. Again, you might give County Boards considerable powers to effect reforms, and to charge the cost on the county rate. I doubt if this would work well, for great opposition would arise, as the area benefited by any sanitary work would not be the same as the area charged with the cost of that work. I think in the long run we shall do more good by enlisting on the side of the sanitary reformer all the influence of public opinion, and obtaining all the light which can be thrown upon sanitary questions by the discussions which take place at Local Boards. It is in this direction that I hope to see an improved state of affairs. I trust to the good likely to arise from the ventilation of the subject by medical officers' reports, by discussion, and by conferences. From time to time these reports are brought to the notice of the public, criticism is brought to bear on the conduct of the Boards in the most flagrant cases, and the authorities are in many instances roused to action by the force of public opinion. I trust that as the public become more enlightened on matters affecting their health and general welfare, we shall see still further benefits result.

Before leaving this part of my subject, I wish to call attention to the decrease in the death-rate. In the two years 1881 and 1882, the proportion of deaths in England and Wales was 19·22 to every 1000 persons living; whereas the annual death-rate from 1871 to 1880 was close on 21·4; and the Registrar-General, in his forty-fifth annual report, states that, had the death-rate in 1882 remained at the same point as between 1871 and 1880, there would have been 48,338 additional deaths in the course of the year. Making an allowance for a change in the age distribution of the population, which he notices

in his report, he calculates that 42,878 lives were really saved in the year 1882 as compared with the average of 1871–80. With regard to the mortality among children between the ages of five and fifteen, it is gratifying to find that the number of deaths has declined from an average of 6·3 in the period between 1861 and 1870, to an average of 5·1 between 1871–80, the main part in the diminished death-rate being due to decreased mortality from the chief zymotic diseases, namely, smallpox, measles, scarlatina, whooping-cough, diphtheria, fever, and diarrhœa. These diseases caused a mortality of 2·9 per 1000 in the first decennial period, but only 2·1 per thousand in the second. Though the whole of this marked diminution in the death-rate cannot be attributed entirely to improved sanitary legislation, yet I have no doubt that legislation and the labours of medical officers of health may fairly claim some share in the improvement.

In conclusion, I will summarise the points contained in this paper.

Firstly, that combined districts giving large areas to medical officers are the right and proper principle.

Secondly, that the areas should be of such a size and population as to occupy the whole time of a medical officer in his public duties, and therefore he should not have a private practice.

Thirdly, that the medical officer should be approved by the Local Government Board, because it makes him more independent for the term of his appointment; and the term of his appointment should be lengthened. With regard to this latter point, I notice that the Local Government Board in their 12th annual Report say they have carefully considered the question, and add as follows: "Hitherto it has been the practice to appoint the officers employed for single districts for short terms, usually not exceeding two or three years; but with the experience which has been gained since the passing of the Public Health Act, 1872, of the nature and the extent of the duties devolving upon these officers, it appears to us that under certain circumstances we may

now not improperly assent to a somewhat more extended term of office."

Fourthly, in my judgment it is not advisable to give medical officers any independent authority, nor is it advisable to give them any power of appeal from the Local Boards either to any proposed new authority, or to the Local Government Board.

Fifthly, that the principle of making the medical officer of health a county officer, and paying him out of the county rates, would not get over the difficulty ; for any expenditure for sanitary purposes must be local expenditure, and would be opposed on the same grounds as now.

Finally, that the best means of promoting sanitary improvement, and awakening Local Boards to their duties, is by the force of public opinion, by public discussion, and by conferences such as the present.

DISCUSSION.

Mr. EDWIN CHADWICK, C.B., said, persons engaged in commerce, manufactures, &c., had a practice of taking stock from time to time, and seeing how, by alterations and modifications, their future progress might be advanced ; and he thought the time had now come when it was exceedingly important to take stock of the progress of sanitary measures, and revise the existing establishments from top to bottom, and consider what alterations past experience proved to be necessary for the advancement of the sanitary science. The duty of a medical officer of health was one point amongst others to which attention might usefully be paid, especially as there was a very frequent disregard of the early doctrine, that a duly qualified man not in preventive practice should be appointed who would give his whole time and attention to the performance of his duties. It appeared to him that it was a specially

grave and mischievous blunder to take two men's half-time or three men's third time, from their private practice, instead of one man's whole time exclusivively devoted to the public: but that blunder in administrative organisation had prevailed to a considerable extent, and professional men in private practice agreed that it was exceedingly important that the detrimental condition should be put a stop to. For the past sixteen years various Acts had been passed by Parliament, and powers conferred for the purpose of putting a stop to enormous mischief in the erection of dwellings unfit for human habitation, and in the overcrowding of the living rooms, but those powers had not been properly put into force, and in revising any working of the machinery, that was one point of great failure for which an efficient remedy should be provided. He thought it was for Parliament itself, if it understood its duty—to enquire how it was that the provisions that it had been at the pains of making had not been executed, and to ascertain whether the fault lay with the central or with the local authority. He believed it would be found very largely in the Metropolis, and very many other places, that this had arisen from the condition of large communities where the people did not, and could not, attend to public business, and hence it fell to small minorities, of men of low condition as to intelligence or of strong interest in jobbery;—it fell into the hands of the very worst people; into the hands of ignorant people—the hands of owners of the very worst class of tenements; and such a state of things ought not to be tolerated. A select committee of the association had some time ago examined the central administrative conditions of the head department, and had suggested effective remedies which had yet to be applied. He was glad to find that Sir James Paget had set the example the other day of stating what was the cost of preventable disease, and he put it on very good authority at twenty million pounds annually, chiefly from the loss of labour by excessive sickness. He (Mr. Chadwick) made it more than twenty-five millions annually, and that

the burthen of taxation arising from this source was three times greater than the burthen of the Poor rates. In London this burthen from preventable disease was 700,000*l.* a year at a very moderate estimate. That capitalised at thirty years' purchase would give a sum of over thirty millions available for constructions and for amendments of existing faulty conditions; for instance, six millions of money had been spent in big sewers of deposit which were really a mischief, whilst every street, court, and alley in the Metropolis might have been drained with self-cleansing drains for one-third, or one-fourth of that amount, if the expenditure had been under competent direction. There was nothing so wasteful as ignorance in local administration.

Dr. SAUNDERS (Medical Officer of Health for Hertfordshire and Middlesex) said Mr. Brown, in his Paper, had dealt somewhat with the tenure of office of medical officers of health, but he ventured to think he had not emphasised that point as much as he might have done, for until medical officers of health got security of tenure in their office, whilst they were still at the mercy of an annual election, and might be removed at the instance of some pettifogging publican whom they might have offended, they would never feel that they were as strong as they ought to be. It was quite true that the Local Government Board had power to prevent these officers being removed, but he was sorry to say they had hardly backbone enough to exercise that power, or at all events they did not do it. He knew a case where a publican elected himself as surveyor, nominated the whole of the Board, and elected a medical officer of health. That gentleman, instead of being a duly qualified man, was simply a licentiate of the Society of Apothecaries, and had no special knowledge of sanitation. That was a sample of what was going on in small Local Boards, who were also fond of appointing local men. The great mischief of that was intimately connected with the question of the notification of infectious diseases which they had been talking of. He lately had to enquire into a case of

an epidemic of enteric fever, and he heard that some one said to a medical man that in a city like that they ought to have a local medical man. The medical man replied, "Do you think I should be fool enough to tell a local practitioner the names of all my cases; I can tell Dr. Saunders who comes and visits us to find out all that is necessary for the good of the people, and I have no fear of him as a rival, because he lives thirty miles of." Security of tenure, therefore, was a point of very great importance.

Dr. WALLACE (Greenock) corroborated the view of the last speaker. It so happened that under the local Act under which Greenock was governed, his office was of such a nature that he could only be removed by an order of the Secretary of State for the Home Department. He was a general practitioner as well as a medical officer, and when he was invited to become a medical officer he made a stipulation that when he was elected means should be taken to secure him tenure of office, because he saw from local circumstances that unless he had some security he would not be able to act with that efficiency and zeal which was imperatively necessary. When the local Act was established a clause was introduced to that effect; but in the Bill to which he referred in the previous discussion, which was at present before Parliament, the Lord Advocate had not seen his way to introduce any clause rendering the tenure of office for Medical Officer of Health secure, which was a great defect. In a large city like Glasgow, for instance, with a population of 500,000, it would be preposterous for the Medical Officer of Health to be at the mercy of an annual election. No doubt there was a full expression of public opinion in a large city like Glasgow, and the well-known reputation of Dr. Russell would no doubt prevent his being disturbed; but it would not be so in other places, and it was rather curious that throughout the whole of Scotland there was no security for Medical Officers of Health, though in small towns under 10,000 inhabitants the Sanitary Inspector could only be removed by the Board of Supervision, which was equivalent to the

Local Government Board in England. That was an anomaly and absurdity. One of the greatest difficulties Medical Officers of Health had to contend with was that of securing healthy homes for the working people, with regard to which there was at present a great outcry in all parts of the country. In this matter the greatest difficulty a Medical Officer of Health had to encounter was the fact that there might be members of the Board having supervision over him who had property of their own in an insanitary condition, and they could easily see how with insecurity of office he would have considerable difficulty in pressing his views on the Board. He agreed with Mr. Brown that the Medical Officer of Health should not be over his Board; but, on the other hand, he ought to have full power to express his opinion at all times to his Board on any matter he considered necessary, for it was only by constantly hammering from month to month and year to year that he could do any good. He might sometimes be considered obnoxious; in fact, since he had been away from home he had seen letters in the local press complaining of his own action with regard to dwellings unfit for human habitation. He certainly thought, therefore, that the medical officer ought not to be removable except with the consent of the central authority.

Dr. DUDFIELD said the Public Health Acts with which Mr. Brown had dealt did not apply to London; but still, there were certain points raised in the paper in which, as a metropolitan medical officer, he was interested, and he might perhaps be allowed to submit a few observations in the way of criticism. It was much to be regretted that the tenure of office by provincial medical officers was so uncertain. A man might have a very good appointment today in a combined district; but if he did his duty thoroughly, and was not possessed of great tact, he might offend his Committee, and get displaced at the end of his term; or if he did his duty ever so well, and possessed ever so much tact, still the different Boards might quarrel amongst themselves, and the combination might break up,

greatly to his detriment. He knew of one such case, in which a medical officer in the country had his emoluments so largely reduced that it was not worth his while to retain the appointment. The original intention of Parliament was that medical officers should be elected for life, or during good behaviour; but it was finally decided that the first appointment should be for five years only. Nevertheless after the first term had expired, the same system had gone on of appointing men for limited periods. That was the case universally where gentlemen were appointed subject to the approval of the Local Government Board, which paid half the salary. There were cases where local authorities, being unwilling to come under the authority of the Local Government Board, paid the whole of the salaries, and selected their own officers at discretion, and without reference to the Board. Sometimes that acted very well for the medical officer, because it became practically a life appointment. It was the rule in London, for out of thirty-nine medical districts he believed there were only two or three in which the medical officer was subject to annual appointment, and a man once elected was practically elected for life so long as he continued to do his duty. The Local Government Board should have more power in relation to the formation of large combined districts, and to maintain the combination when once formed. He believed the great reason for their not seeking greater powers in this direction was that the question of County Boards was looming in the future, and they wanted to have that question settled before proposing any further legislation on this subject. With regard to the relation of inspectors of nuisances to medical officers of health, he understood that in the country they were to a large extent independent of one another. In London they were also independent officers legally; but as a matter of practical convenience, the medical officer was looked upon as the head of the inspectors, who, as a rule, reported to him, and any reports to the local authority would be made through him. That appeared to him to be the best relation for

practical purposes which could exist. Where there was complete independence, in practice there was risk of differences, and it was necessary to have an intelligent man, such as the medical officer, at the head of the sanitary department if it were to be worked successfully. The only other observation he would make was in respect of the necessity of power being given to the sanitary authorities to make the local authorities themselves do their duty. With reference to Poor Law matters, the inspector of the Local Government Board went about all over his district constraining guardians to carry out the law ; and in order to the perfect working of sanitary administration, something of the same kind was required with regard to public health matters. It seemed to him an absurd thing that there should be any sanitary defect allowed to continue which could be removed by the operation of the law. He did not think the law was perfect, but there were many powers which had not been put into operation, and before they sought for increased powers, they should carry out those they had already possessed. One reason possibly why existing powers were not carried out as they ought to be was because local authorities in the country and in towns also were very often under the influence of men who came on to the Board in order to promote their private interests.

Mr. BROWN, M.P., in reply, said the great need seemed to be in some means for insisting on local Boards doing their duty ; but unless autocrat powers were taken to do everything in London, it was very difficult to go beyond what they were doing at present. He was quite aware of the truth of what had been said, that in many cases Medical Officers of Health were so hampered in their duties, that nothing was done. He perhaps ought to have said that he was dealing with this subject as known to the general law, the Act of 1875, which did not apply to London, but to urban and rural districts outside London. He quite agreed that the term of appointment ought to be lengthened, and that the officers ought to be more

irremovable than they were at present ; if they were, their reports would have more weight, and there would be a better chance of getting further sanitary measures carried out. There were at present 577 rural sanitary authorities, and in 527 cases the Medical Officer of Health could not be removed except with the consent of the Local Government Board. Of urban districts there were 947, of whom 579 could not be removed without the consent of the Local Government Board.

The CHAIRMAN said it now devolved upon him to close this Sanitary Conference, and he hoped all present would be of opinion that the papers read had evinced remarkable ability, and had been inspired by a humane and enlightened spirit. He trusted the general result would be not only satisfactory to the public interested in sanitary matters, but also to the members of the Social Science Association, under whose auspices the Conference had been held.

Mr. EDWIN CHADWICK then moved a vote of thanks to the Chairman for the able manner in which he had conducted the business, and said the Society was particularly indebted to him for accepting the presidency.

The CHAIRMAN having briefly responded, the proceedings terminated.

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